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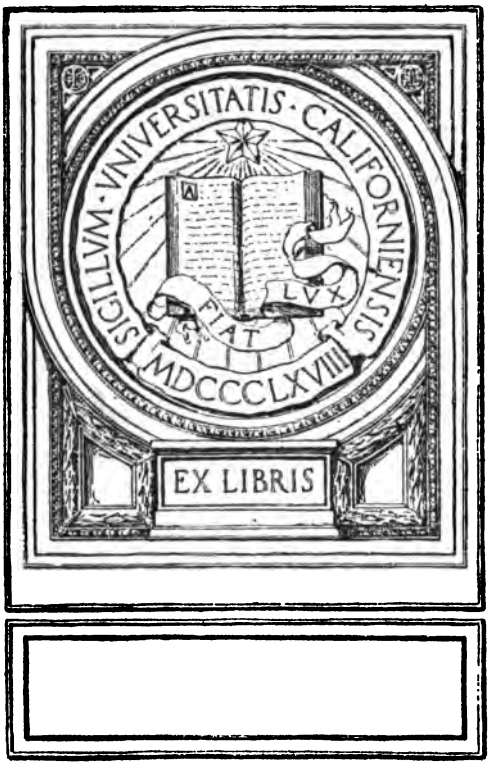
THE NEW GOLF

R. A. VAILE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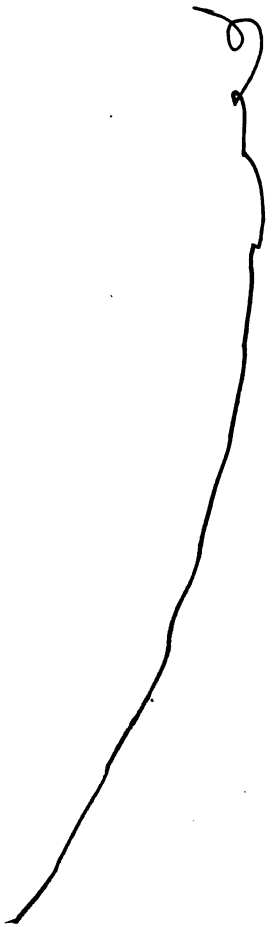

JEROME D. TRAVERS

THE NEW GOLF

BY

P. A. VAILE

Author of "Modern Golf," "The Soul of Golf," etc.

CONTAINING FORTY ILLUSTRATIONS FROM PHOTOGRAPHS

NEW YORK

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PREFACE

THERE are always many people who say that golf cannot be learned from a book. Neither can arithmetic, unless one assiduously practises the actual work. Yet no intelligent person would try to argue that the arithmetic book is superfluous. The fact is that the American has in the past played most games by imitating other people. It is a fine way to learn, but it is not always the quickest, and it certainly is not the most scientific or intellectual.

Golf in America is making amazing progress. Many of the greatest intellects of the nation get their recreation on the links. The youth of the country is playing the game in a manner that is not equalled by the youth of any other nation, either as regards quantity, quality or sex. The women of America are playing it. It is making playmates of parents and children, husbands and wives who otherwise would not be so close to one another. It is a mighty industry, a great factor in business and social life, and every day it is becoming more so. 'Unless one can play, or at least talk intelli-

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gently about, golf, one has to miss about three quarters of the conversation in any country club—and many other places—in America.

This may seem a poor way to look at a great game. It really is not so. There is more golf in the atmosphere than politics or religion. Nobody cares to be quite ignorant of the subject that is engrossing the attention of one's friends and relations. It is therefore becoming increasingly important for every one to know at least enough about golf to avoid being bored to distraction.

This is a very insidious method of adding to the rank of the golfers. It is right that one should get this knowledge—this theoretical knowledge—first. It is so much pleasanter for him—and the other people—when he sets out to put it into practise, as he undoubtedly will.

In arriving at the new golf it was of course necessary to know "Ye olde golfe." In comparing the new thought and the intellectual advance in the game with what has gone before it has been impossible to avoid reference to the works of the great masters of golf, men whom every good golfer honors for their skill in the execution of the game and for the admirable manner in which they all so worthily maintain their position in it in every way. All advance in any science is built upon the achievement or error of

the men who went before, and even the errors of the earnest student are frequently good for the man who comes after. I have been led to the truth by a famous man's error, the same error as I myself had made before him, but I did not see it until he made it. Then it was clear to me.

So, it has been necessary for me to use the work of the famous men, who have gone before me in the history of golf, in building up *The New Golf* and the secure foundation for The New Thought in golf, which is of infinitely greater importance. Knowing golf thoroughly and thinking it keenly cannot make the game less interesting or beneficial, and that I am sure will be proved by a careful study of *The New Golf*.

I must impress on my readers the fact that in nearly every case where a golf book has been produced in England under the name of a famous professional it has been written by some golf journalist who is not himself entitled to speak with authority. In this manner much that is not even "olde goffe" has become associated with the names of the famous players,—much, indeed, to which they will not now subscribe. The trouble is, however, that it is still circulating with all the authority of their great names and will so continue to circulate unless The New Thought in golf damages it severely—as I think it will.

PREFACE

Americans really are keen and analytical about their game. They desire always the shortest road to proficiency. I believe that in *The New Golf* I am showing the American golfer that road. If this work is not a primer to the beginner and a valuable friend to the champion, and this indeed is "a far cry both ways," it will have failed of the purpose which inspired its production.

P. A. V.

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THE NEW GOLF

THE NEW GOLF

CHAPTER I

THE RIGHT WAY TO LEARN GOLF

If one employs a professional to teach one golf the first thing he does is to hand one a driver. Then he tells one a good deal about the mystery and difficulty of golf and proceeds to try to teach one the drive, the most difficult stroke in golf, first.

I am calling the drive the most difficult stroke in golf. It is not so to everybody, but it is sufficiently so to give point to my illustration, for in the drive there is probably at least as much opportunity for error as there is in any stroke in golf.

I maintain that in a game which makes such a full and insistent demand for accuracy as does golf, the only correct method of instruction is to take the beginner by natural gradation from the easiest stroke to the most difficult. In all good tuition, in sport or science, this is the invariable

rule. For some inscrutable reason it is openly and ruthlessly violated and contemned by all professional golfers. The result is, not unnaturally, that an amazing number of people who pay much money to learn golf are not learning it.

It would not be so bad if it stopped at this. Unfortunately it does not. Many of these poor people start golf late in life. This method, or lack of method, in teaching makes of many of them merely golf-cowards. One has heard of men and boys who are "gun-shy," who fear the noise and the recoil of the gun.

Who has heard of the "ball-shy" golfer? Yet there are many thousands of him and her, who have been converted into golf cowards because they were set a task quite beyond their powers at the beginning. They were made to feel that the ball was their master, their tyrant, instead of their faithful little friend and servitor.

Some few escape being ball-shy, who are started late in life on wrong methods, but thousands succumb. Now there can be little doubt that the proper way to start teaching any one golf is on the putting green. Putting is quite half the game of golf and it is the most important part of the game; yet it is ridiculously and shamefully neglected.

The right place from which to start any one who really desires to learn golf thoroughly is any-

where from six inches to a foot from the hole. From this point one may back the pupil through his clubs until he arrives at the tee—and his driver.

When I first wrote this in 1909 it was, although most obviously sound, regarded as revolutionary teaching. Now, the best professionals start their pupils, if not on, at, the green. Any one who has patience and perseverance enough to start in this way, and to keep on at it for some time, will be astonished at the solidity it will give to the foundation of his game—his putting—and at the confidence it will breed in him when playing through the green and from the tee.

There are good reasons for this. Perhaps the first is that this method of learning teaches one in a very natural and easy manner to keep one's eye on the ball. Starting within a foot of the hole gives one a stroke which one feels sure of being able to play. It also is of such a length that both the hole and the ball are within one's focus. This means that one has no temptation to raise the head and lift the eye in order to follow the run of the ball to the hole. This is a matter of much greater importance than is generally understood. The beginner does not start with his ball cocked up on a little mound of sand. He has to play it as it lies on the green. He gradually becomes accustomed

to this and so it seems quite natural for him to do so when, by easy stages, he gets off the green and has to play his chip-shots.

I know perfectly well that very few golfers ever learned in this manner. I certainly did not, but that does not alter the fact that there is a right way and a wrong way to do everything. I am giving the right way in golf, but it is not compulsory if any one cares to sacrifice the advantage of it and to learn in the usual way the most difficult strokes first.

From a purely scientific point of view there can be no doubt of the advantages of the course suggested by me, and I am building up my book to a great extent on these lines; but from the practical side of the question it will probably be found expedient to encourage any one who shows any ability to do so by letting him have a few hits at the ball with a driver. The insistent cry of the beginner to the professional is "Teach me to swing." The result unfortunately is that frequently they get the swing and nothing else. So those, who want to do so, may read the analysis of the drive and the master stroke after they have studied the chapter on putting.

The player, who will learn as I suggest, will make the valuable—to elderly players the invaluable—discovery that the drive is much more of an

(1) The left hand Grip

(2) Taking the Overlapping Grip

(3) The Overlapping Grip Complete

THE VARDON OR OVERLAPPING GRIP

exaggerated put than is commonly understood, and this apparently extreme statement has special application, as will be seen later, to the master-shot in golf, the drive with back-spin.

Too many beginners worry about their style. The player who thinks of style first at any game deserves all that comes to him. No man who cares anything about a game, certainly no man who is worthy to play golf, should worry about his style. His whole endeavor should be to produce his strokes in a manner that is mechanically perfect. If he succeeds in doing this he may rest assured that he will have in his stroke so much of style or finish as it is possible for him to get. If he should desire style at the expense of efficiency I have no word for him.

CHAPTER II

GRIPPING AND SOLING THE CLUB

THERE are quite a number of different grips that may be advantageously used for playing golf—by different people. I have very little doubt that of the grips commonly used that which is generally called "The Vardon grip" is the best.

The Vardon grip was not introduced by Harry Vardon. It was known and used before Vardon took it up, but he undoubtedly set the fashion for it and it is the best of the known overlapping or interlocking grips.

I may say at once that I do not believe in any of the interlocking grips although we have one or two cases of golfers who have made history by the use of some form of interlocking grip. I cannot see any possible advantage in an interlocking grip that cannot be obtained better by an overlapping hold.

The outstanding features of the Vardon grip are that the thumb of the left hand is buried between the palm of the right hand and the shaft of the club and the little finger of the right hand

rides on the forefinger of the left. This grip, with slight differences in the positions of the hands on the shaft, is used by Braid, Taylor, Vardon, Duncan and many of the leading golfers. The great claim made for it is that it brings the wrists more closely together and so leads to a more harmonious action.

There is very little doubt that this claim is well founded. It is not, however, so certain that the advantages of the grip are so great as is commonly supposed in England. In America the grip is not nearly so popular as it is in England where golfers are extremely prone to follow the lead of success. Some very fine English golfers have not adopted the overlapping grip and in America a great number of the leading players still use the old two handed grip.

In speaking against the Vardon overlapping grip one is confronted by a fairly stiff argument in the shape of at least sixteen open championships won with it. It sounds almost revolutionary to say it but I am inclined to think that this does not necessarily prove that the Vardon grip is the best for golf or even for the majority of golfers. On the contrary, I am inclined to think that for the majority of golfers it is a dangerous grip and one that is calculated to induce the player to ease his grip with his right hand during the swing, and

this is a particularly objectionable habit to cultivate.

If one must use an overlapping grip I am inclined to think that the reverse overlap to that used by Vardon is safer and for at least ninety per cent. of golfers more efficacious than that in general use. In this case the forefinger of the left hand over-rides the little finger of the right, the left thumb as in the Vardon grip lying at the base of the right thumb between the shaft and the palm of the right hand.

The Vardon grip, in my opinion, tends unduly to weaken the grip of the right hand while the suggested overlap gives the right hand its proper position on the club, does away with the great tendency to open up the right hand, and exerts a most beneficial influence in checking one of the most prolific causes of inaccuracy in golf, namely, the deep-rooted tendency to overswing that seems to be inherent in most golfers—or would-be golfers. This shortening of the swing is of much greater importance that is realized, and I shall have occasion later to deal with it fully.

It is however impossible to dogmatize about the matter of grip. There is probably one grip that is best for most players. I think that the new grip suggested by me will, in the course of a few years, perhaps sooner, come into general use, but

even then, it will not suit every one. So it resolves itself into this for the individual. He must try the various grips and choose the one that suits him best, if he is going on his own judgment, assisted by the book, or he must (in reason, of course) follow the advice of his professional, but always I should advise a beginner, and indeed any player who is off his game, to try the new overlap, as I am convinced that it has advantages that the Vardon overlapping grip does not possess.

I do not want to enter into any wearisome argument in favor of the new overlap. I may however direct the attention of my readers to the remarkable records of Messrs. John Ball and H. H. Hilton. The Vardon overlapping grip played no part in making their fame, therefore it is at least certain that the overlapping grip is not a necessity. Argumentative people may point to the records of Braid, Taylor and Vardon. The answer is that probably these men would have won with any of the grips used in golf. We may even go further and say that we cannot possibly say how much better they might play if they were to adopt the proposed method of overlapping instead of that used by them.

Now there will be few to deny that the golf of Messrs. Ball and Hilton is right-handed golf.

Allowing this to be the case what argument can we find in changing grips for making so sudden and radical a change as to deprive the right hand of its place of honor on the shaft and for giving that to the left, for that is what we do in the Vardon overlap. We take away the full grip with the right and give that to the left. In the proposed overlap I proceed by the more natural stage and allow the right hand to take its proper place on the shaft without being interfered with in any way, for the insertion of one thumb at the base of the ball of the other thumb cannot be regarded as an interference; indeed it is probably very useful in tending to prevent one getting too much of a palm hold.

Gripping the club correctly is unquestionably of very great importance and it behooves the beginner to try most carefully and earnestly to get the grip that suits his hands and build best. It is, as I have at various times indicated, almost impossible to dogmatize on this subject, but there is another matter of fundamental importance which should be taught just as soon as one knows how to hold a club, yet is most consistently neglected in nearly every book on golf and by at least nineteen of twenty professionals. I refer to the soling of the club.

Many quite good players handicap themselves

by their faulty method of soling the club. It is not unusual to see golfers addressing the ball with the toe of the driver cocked up in the air and the heel resting on the ground. This is a mistake. At the address one should strive to place the club as nearly as may be in relation to the ball in the same position as one intends it to be when it returns to the ball in the downward swing.

It must be remembered that the sole of the club is meant for the club to rest on. It is not necessary in addressing a ball that the club shall rest on its sole, but in ninety per cent. of golf strokes it is advisable that the sole should be allowed to perform its office. The loft of a club bears a definite relation to the sole. This has been settled by the club-maker. Therefore in addressing your ball let your club rest on its sole. This is a good general rule though it is not without many exceptions to prove it. For instance, my most prized mashie has practically no sole, for it starts curving upwards and backwards directly it leaves the lower edge of the face of the club.

A player should not require the sole of his club by which to sole his club, but it is undeniably expedient in most cases, when addressing the ball, to lay the club so that it rests easily and naturally with the whole of the sole in contact with the turf.

As one gains experience it is probable that one

will have a club or two, especially in the future, that does not give the fullest indication of how to sole it by the shape and breadth of its sole; also, of course, the soles of many clubs are now curved. The player will however be well advised, wherever possible, to sole his club in the manner indicated by the make of the club. I cannot make this too clear, for it is a matter of the greatest importance. Let me therefore give a very simple yet forcible illustration.

One is addressing one's ball for a drive with an ordinary driver or brassy. Imagine that the shaft is sawn off at the socket. Take the club head and put it down on the turf behind the ball so that it rests fairly and flatly behind the ball, and so that a line taken from the face of the club through the ball to the hole would form with the front edge of the face of the club two right angles.

The idea in one's mind must be that the face of the club runs at right angles to the line to the hole at the moment of address and particularly at the moment of impact. This is always of vital importance especially in putting.

Remember that there must be no cocking up of the club in any way. It must rest truly and fairly on the sole. There are four ways in which people offend. They address with the club cocked up at the toe, which is very bad. Others address with

the club down at the toe. This is a rarer and a worse fault.

A by no means uncommon fault is to address with the front of the sole a little off the ground while others again are inclined to lift the back of the club and press down in front. All of these eccentricities should be avoided and the club allowed to rest firmly and lightly on the grass.

Most professionals now sole the club in front of the ball when addressing for the put. It is astonishing how these fashions spring up and take hold. The idea is that one is able to get a better line from the face of the putter to the hole if one's view is unobstructed than one can if the ball comes between one's putter and the hole. Great putting was done, before this method was introduced, by people who have not used it, much very bad putting has been done by champions who have used it, and much really good work has been done by players who habitually use it.

This is a fair summing up of the case so far as regards this method of address. Most of the great players in England do it, but unless one can put better this way than in the old style it is inadvisable to worry about altering one's method. There are many details in connection with soling the club and putting that are of infinitely greater importance than this matter.

CHAPTER III

PREVALENT MISCONCEPTIONS ABOUT THE GOLF STROKE

THERE is so much misconception about the stroke in golf that it is expedient to dispose of as much of it as possible before dealing with the strokes in the usual course.

It will be noticed that I say "the stroke in golf." We shall be told that there are many strokes in golf. Well, so there are, but it will trouble any one to get one that is not an exaggerated put or some part of a drive. Indeed there are not wanting those who assert that a drive is merely a highly developed put. We need not follow this argument too far, although it may be said, right at the beginning, that for many people, particularly those who take up golf late in life, the nearer they can keep their drive to the put the better for them; and this has been proved to be very sound golf.

It is of the utmost importance for any one who intends to learn golf, or for any one who has learned, or is learning it, and is not satisfied with the result, to understand that above everything, if one wishes to play a fairly good game, it is

necessary to give nature a chance. This is precisely what a vast number of people will not do at golf. Why they persist in this foolishness is the one great mystery of golf.

If one were to take the ordinary man up to a daisy drooping its head in a field, hand him a walking stick and say "Let me see you cut its head off" the chances are that he would unconsciously play a perfectly good right handed golf stroke. With many it would no doubt be a trifle short as the suggested operation would not need much strength, but it would be a natural hit, and that is what the golf stroke, to be successful, must be.

We must now try to disencumber our minds of quite a number of strange ideas which are very prevalent amongst golfers and golf writers. It is amazing what a great number of things it is expedient to forget when once one gets opposite the ball. As a matter of fact there is just one thing to keep firmly in mind and one only and that is to hit it. If the result is unsatisfactory one may then hold the post-mortem.

"Slow back."

Of all the parrot cries of the links "Slow back" is perhaps the most insistent and also one of the most unnecessary. When once one has got one's swing under control, to insist on one's going back

slowly, and to think of doing it, is merely adding another difficulty to the swing.

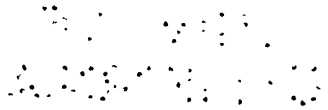
It is unnecessary to go back more slowly than just enough to ensure that there is no conflict of forces at the top of the swing when the upward swing ceases and the downward swing begins.

In a natural swing it is quite unlikely that there will be any conflict for a peculiar reason that has not, so far as I am aware, ever been stated in a golf book or an article on golf. The downward swing really starts before the upward swing is finished.

This is a paradoxical statement but it is quite sound as any one who is sufficiently interested can prove by a close study of motion pictures. The body leads the hands and arm in the return stroke. It starts to twist back towards the ball before the club has dropped to the lowest point over the player's left shoulder. I believe I am correct in saying that this is the first time this has ever been brought out.

It will thus be seen that even in the quickest of drives, unless the action is quite stiff and unnatural, there is not, as is usually supposed, a moment at the top of the swing when the upward swing gives place suddenly to the downward. As a matter of fact, the one merges in the other in such a remarkable manner that it would be im-

THE NEW OVERLAPPING OR VAILE GRIP



possible to say where or when the downward swing begins. Any student of golf who thinks that he can do this will find his time well spent with action photographs of the famous golfers of the world at the top of their swing.

There can be no doubt that the top of the swing is a critical position. If one arrives at the correct position there one has a reasonably good chance of returning correctly to the ball. It will therefore be seen that one must in swinging back be careful not to do so with undue speed for in that case there would be a chance of introducing an element of unsteadiness into the swing at a point where it is especially undesirable.

There is an excellent reason against "Slow back" which one does not very often hear advanced. It is impossible to preserve anything like rhythm in the swing if one consciously tries to make one half of it much slower than the other. Anything of this nature should be by sub-conscious effort, otherwise the due relation of the upward and downward swing is lost. This ancient "slow-back" maxim is perhaps the first thing to forget in making the golf stroke.

Swinging back.

A very misleading idea of the beginning of the golf stroke is generally given by books and in-

structors. The pupil is told to swing the club back. In the address the club is practically at the bottom of its arc. It cannot swing upward without power being found for it. As a matter of fact, the club is picked up off the ground by the hands and wrists and carried naturally back by them and the arms even as the walking stick was in the daisy cutting experiment.

Any attempt to swing the club back will very likely result in the hands getting away backward before the head of the club, which is a bad fault. In the swing of most of the old St. Andrews golfers the first thing in the swing back was the press forward.

This is another very sound paradox. Directly the player starts to hit the ball he pushes his hands forward an inch or two which turns the face of his club over a little toward the ball. I have never heard of or seen any explanation of this habit, but there can be no doubt that it gives one a nice clean pick up of the club and it certainly tends to prevent the wrists hurrying away before the head of the club.

"As you go up so you come down."

This is one of the most revered of golf's hoary old traditions, most of which are extremely unsound, as indeed is this. One has undoubtedly

a great tendency to come back to the ball by the same route as that which one uses to get to the top of the swing. It will, however, be apparent that if one goes back, as one is instructed to, well in a line with the ball for some inches and fairly, or perhaps I should say comparatively, slowly, and then returns at top-speed to the ball, as one must in order to drive well, one will return by the most direct route possible, which route one certainly did not take on the upward swing. This is another of those incorrect and unnecessary "axioms" that may with much advantage be forgotten.

There is one good point in this unsound "axiom." It may perhaps make the golfer strive both in the swing back and the downward swing to keep his club head travelling for as long a time as possible, or rather for as great a distance as convenient, both in the upward and downward swings, in the line to the hole produced through the ball. This is of importance.

Distribution of weight.

Practically all books and all professional golfers teach the distribution of weight in the golf swing incorrectly. This is a very broad and sweeping statement but it is a fact. The distribution of weight particularly in the drive is of vital impor-

tance. All the greatest golfers say that at the top of the swing the weight must be on the right leg. This is quite wrong, and if one follows their instructions, it is a physical impossibility.

What one must try for is to have the weight absolutely evenly distributed between the legs at the top of the swing. If one tries for this the major portion of the weight will go where it ought to be, namely, onto *the left leg* and *not* onto the *right.*

The great golfers tell us that at the top of the swing all the weight goes onto the right leg. This is very bad golf. Since I exposed the fallacy of this statement some of them now go to the other extreme and say that it must all be borne on the left foot. This is probably a worse error. The truth lies between these extremes. Try for equal distribution and one will get *a slight excess* on the left foot, which is as it should be.

This matter is however of so much importance that we must, in dealing with the drive, give it further attention.

The golf stroke a sweep and not a hit.

Probably the most remarkable misconception on the part of the most famous golfers and authors is the wonderful idea that the golf drive is a sweep and not a hit.

I may mention incidentally that one of the most eminent scientists in England measured the duration of the drive in golf and found it to be one ten-thousandth of a second. This, I may mention parenthetically, is truly a gentle sweep!

This idea of sweeping the ball off the tee has been encouraged to an amazing extent by all the leading professionals and writers, even by J. H. Taylor, whose terrific right forearm punch is so famous.

James Braid also encourages the idea. In Chapter VIII of *How to play Golf* he says: "The chief thing to bear in mind is that there must be, in the case of play with the driver and the brassie, no attempt to hit the ball, which must be simply swept from the tee and carried forward in the even and rapid swing of the club. The drive in golf differs from almost every other stroke in every game in which the propulsion of a ball is the object. In the ordinary sense of the word, implying a sudden and sharp impact, it is not a 'hit' when it is properly done."

This really is a very remarkable statement. If one ten-thousandth of a second is not a sufficiently "sudden and sharp impact" to warrant the golf stroke being called a hit I should like to know what speed is demanded before we go from the realm of the sweep into that of the hit.

As a matter of simple fact and plain common sense the stroke in golf, except possibly in the put, is a hit and not a sweep. Even in the properly played put it is open to argument whether or not it is technically a hit. With many, who are usually unreliable putters, it undoubtedly is a hit, but that matter we must consider more fully in another place.

This strangely persistent delusion about the golf stroke being a sweep has ruined the game of many thousands of players. I do not know of any stroke in the whole realm of athletics wherein, at the moment of impact, the striking implement is traveling so fast as the golf club does at that time, yet I never heard of this very silly claim being set up in tennis, cricket, polo, or indeed, in any other game. I am glad to say that the development of modern thought is tending to restrain these flights of imagination and that the player is getting every day a greater chance to be himself, to play the game as every game that is worthy of the name should be played—naturally and unaffectedly.

Regulation of stroke during impact.

The player must forget everything that he has ever read or been told as to what he can do to the ball while it is on the club, that is, during

adhesion. The club and the ball are in actual contact and travel for a very short distance together. This is technically called adhesion. This period is so much less than what we understand by the word instantaneous that it is quite useless to try to convey to my readers any idea of its duration. It has been computed—as I have said—by one of our most capable physicists at one ten-thousandth of a second.

It will be quite apparent then that it is utterly useless for a human being to think that he can time his stroke in such a manner that any special thing he does in that period can have any effect on the ball.

We are told by quite experienced players, like Mr. W. J. Travis for example: "The science of the stroke consists in hitting very sharply, and turning the wrists upward immediately after the ball is struck."

Now the truth is that whatever one does to the golf ball during impact is merely an incident in the predetermined course or arc of the club head. The stroke is played at such a great pace that it is impossible to do anything during impact that is not in the swing of the club both before and after impact. James Braid emphasizes this. Let us see what he says: "While it is of course in the highest degree necessary that the ball should be

taken in exactly the right place on the club and in the right manner, this will have to be done by the proper regulation of all the other parts of the swing and any effort to direct the club on to it in a particular manner just as the ball is being reached, cannot be attended by success."

This strange fallacy was very prevalent in England until I demonstrated its falseness. There were not wanting serious students of the game who asserted that they actually saw Vardon producing his pulled drive by turning his wrists over at the moment of impact. It was years before they saw the futility of the action, if it had been used, and the falseness of the assumption that it was used.

It is however so important that the student should get rid of any lingering notion of this kind that I quote James Braid again. He says: "If the ball is taken by the toe or heel of the club, or is topped, or if the club gets too much under it, the remedy for these faults is not to be found in a more deliberate directing of the club on to the ball just as the two are about to come into contact, but in the better and more exact regulation of the swing the whole way through up to this point."

He continues: "The object of these remarks is merely to emphasize again, in the best place, that

the dispatching of the ball from the tee by the driver, in the downward swing, is merely an incident of the whole business."

I repeat these important words "merely an incident of the whole business." I have in various places emphasized this matter as much as possible. It is another of the many fallacies of golf that must be absolutely forgotten by the learner or the golfer. Any attempt to introduce it into practical golf must end in trouble.

Importance of the follow-through.

The player, especially the beginner, must get rid of the idea of the importance of the follow-through in golf. A totally disproportionate place is given to this part of the stroke *in the minds* of most people. The follow-through, by which we mean the proper completion of the stroke after contact with the ball has ceased, is *in itself* of no practical importance.

Let me illustrate this clearly. A man may have played a magnificent drive both as regards length and direction and his follow-through may have been perfect. Supposing now for the sake of argument that a stray bullet had caught the head of his club, at say six inches after the ball had left it and had smashed it to pieces, the result of his stroke would have been just as good. The im-

portance of a good follow-through is that it is an indication that the first part of the stroke was well played. The pace of the drive at golf is so great, that, provided one plays the first part of it up to the impact correctly, it is almost impossible to have a bad follow-through.

Players may be excused for thinking that the follow-through has an influence on the flight of the ball, although obviously nothing that the club does after impact can affect the carry, for James Braid himself subscribes to this delusion. He says: "The success of the drive is not only made by what has gone before, but it is also due largely to the course taken by the club after the ball has been hit."

I can remember playing a very good drive across a small river and about two hundred yards up a hill on the other side. The tee was within a few yards of the river. The force of my drive smashed my club head off at the splice and carried it away into the river, but I had never played a better shot at this hole, nor did I ever do so afterwards. If I had ever suffered from the delusion about the follow-through affecting the stroke this would have cured me. Every golfer who has played a little has experienced, or seen, or heard of, similar incidents to that which I have told. Its importance lies in the fact that one can use

it to expel the follow-through bogey, which is dangerous, for it takes the sufferer's mind forward to a part of the stroke that, comparatively speaking, is unimportant and removes it from the portion that is all-important.

Foot-work.

Good foot-work is important in golf, but a vast number of people have very little idea of what good foot-work means. Most of them think good foot-work means much foot-work. It would improve the game of many if they would reduce their foot-work to a minimum and make a vow never to get onto their toes; nay more, in the case of many elderly players, particularly those who have started late in life, if they swore never to raise their heels, and kept their vow, they would be saved much swearing of another kind.

Correct foot-work is of the first importance in the rhythm of a perfect stroke. It is generally taught wrongly from the start. One is told that the left heel comes away from the ground when the arms have gone so far back that they seem to drag the left heel up. This is bad teaching. The left heel, in a drive of perfect rhythm, leaves the ground almost at the same instant as the club head leaves the ball, certainly at the most a fraction of a second later. It is very bad form to

wait until one feels the demand of the arms before one raises the heel.

The exact apportionment of the weight to the feet and the best method to be employed will be dealt with in detail in the chapter on the drive. In the meantime, however, it may be said that the methods there set out are for those who find themselves physically able to use them without undue fatigue. In the perfect foot-work of a Vardon, for instance, there is an amount of ankle and instep work that would be very fatiguing for an elderly and heavy man. This should be avoided as much as possible by any one answering the description. It would hardly be exaggeration to say that there is excessive foot-work in golf, especially on the part of those who make a fetich of the full swing.

The question of foot-work may be fined down to a very small point. Our feet are of course the base—some would say bases, or basis—of our drive. In a stroke, which calls for such mechanical precision as does the drive in golf, we must endeavor to have our base as firm and as constant as possible.

It behooves every golfer, therefore, be he young or old, once he has taken his stance, to see that until he has hit the ball, he does not indulge in any heel-twisting. That is a new term, which

Front View

Rear View

THE VAILE GRIP

means that if you move your heels it must be merely up and down, until after the ball is hit. Many players raise the left heel and screw round on the point of the toe so that the left heel is presented to the hole. Let one try to finish one's drive in this position. One speedily finds that it is impracticable without moving one's heel back into position. This means that if, at the top of the swing, one assumes this position, one must, during the downward swing be shifting round on one's left foot. This is a bad habit, which must be avoided, for such a performance during the downward swing cannot possibly make for accuracy. How it may be avoided will be shown in the chapter on the drive.

The power of the left hand and arm.

In attacking the idea that the left arm is the dominant factor in the stroke at golf one is assailing a tradition as old, almost, and as carefully nourished as golf itself. The bare idea of such heresy set the golfing world of England in a blaze, but by the time the flames had died away, the insolent little idol was badly damaged.

I do not think that this fetich ever had quite the hold in America that it had in England and Scotland. This probably is explained by the fact that the American is not so prone to "go blind" on

what some celebrity says. He has a way of asking for reason. To use his expressive phrase he is "from Missouri," and he wants to be shown. The disciples of the left hand and arm have a hard time when it is put squarely up to them like this, for as a matter of fact and practical golf, it is almost impossible to produce any satisfactory evidence in favor of this ancient claim.

Notwithstanding this, nearly all the great golfers, including Braid, Taylor and Vardon, either expressly or by implication, support the idea. The player, particularly the beginner, must forget this notion and allow himself to play his stroke naturally and without any idea of either hand dominating the other. One of them almost certainly will, but which one that is may quite well be left to Mother Nature.

The wrists.

More trouble than enough is caused by players being told how to get their wrists into their drive. They are given a totally erroneous idea of the function of the wrists. This is another of the many fallacies of golf that must go into the scrap-heap.

There is in golf no such thing as a pure wrist stroke. Even the put does not come within this category. There is no stroke in golf that may

correctly be called a pure wrist stroke, except perhaps a six-inch put.

It is important that the student should have a good general idea of these common delusions and the truth before he settles down to try to understand golf. I have, for that reason, where necessary, dealt briefly and concisely with most of the popular misconceptions about the game. I shall hereafter in various chapters have occasion to refer more specifically to these points as their importance warrants.

CHAPTER IV

PUTTING

PUTTING is the foundation of the game of golf. It is extremely simple and easy to learn. I could take an old lady, who could not by any possibility ever make even a fair golfer, and convert her into a good putter, yet there seems to be a general conspiracy on the part of the most eminent golfers to make out that one cannot be really good on the green unless one was born with a special putter in one's hand.

This, as I hope to show, is pure moonshine. Putting is probably the simplest operation in the simplest game that is played, for golf is a simple game. The demand of golf is not for excessive brains. It is for extreme mechanical accuracy, accompanied preferably by a considerable amount of what I have heard called "Saxon phlegm"; but, I have no doubt that, provided the accuracy is there, the American variety of the other qualification will be found sufficient for all purposes.

Putting is not practised as it should be. If one would only realize it the put is beyond all ques-

tion the master stroke in the game. By master stroke I mean here, not the stroke calling for the greatest skill in execution, but the most important stroke.

I must give an illustration of this that I have given again and again, but it is so striking that I am always prepared to risk some one telling me that it is not entirely fresh. We may take 72 as a good score for any course. If we allow two puts per green we see that exactly half the strokes are played by the putter, leaving the other half to be distributed amongst the other clubs in the bag. As a matter of fact, more than half the strokes in a first class tournament are played on and in the immediate vicinity of the green. Players would do well to get this idea firmly into their minds. It might make them give the short game generally some portion of the time they lavish on the drive. Not that the drive is unworthy of all the time one can spare for it, but there is such a thing as proportion, and excessive devotion to the drive must mean a badly balanced game. Moreover it should always be remembered that the most awkward man to defeat is the one who knows his mashie and his putter.

The ideal action for a put is that of the pendulum of a clock, presuming of course that the line to the hole is parallel to the face of the clock. It

is impossible to give any better notion of the ideal put than this.

In practical golf one does not often see it, for a variety of reasons which need not be enumerated here.

The first point of importance that the pendulum teaches us is that it has one bearing on which it swings. Our put will swing in the best possible way if we give it one bearing. To do this, or to get as near to it as is practicable without using one hand, means using one of the overlapping grips. I think it is beyond question that one of these grips, probably the one which allows the left forefinger to overlap the right little finger, is the best.

Either this or the Vardon overlapping grip will be found the best for putting. Those who are unaccustomed to them find them a little peculiar at first, but when one has felt the smooth flowing action of putting with the hands brought together in this manner, one is not very likely to return to the old two-handed method.

There is probably more variety in style in putting than there is in any other branch of the game. This to a very great extent arises from the fact that there is much ignorance of the mechanics of putting. For instance there is for each player one *best* distance at which to stand from the ball.

Many players quite ignore this. One should address one's put so that a plumb-line from the bridge of one's nose would hang in a line through the center of the ball. This it seems to me is the cardinal rule. If one does this the lines from the eye to the ball, from the eye to the hole and from the ball to the hole are all in the one vertical plane.

If one addresses the ball too far in or too far out it means that one has three different lines to look down; with a ball too far in there is one line from the eye inwards at the ball, another inwards from the eye and at a different slant to the hole and then the line of run to the hole which really does not "connect" or "run into" one's eye at all, so that one is really putting over a line other than that along which one is looking.

There are so many putters that I hesitate to say anything about any particular putter. This I may say however and that is, avoid like a pestilence the shallow-faced putter. They are a delusion and a snare for about ninety-five per cent. of golfers and probably half a delusion for quite eighty per cent. of the remainder. They are a most dangerous and unreliable club, as the lesson of Braid and Vardon's putting will show, although Braid, so far as I know, never used the very shallow face.

The first time I saw Braid putting was at Wal-

ton-on-Heath in England. He was trying a Vaile putter for me as I wanted his opinion of it. To my surprise he came down on the ball from the back and finished on the turf an inch or two in front of where it had been.

In those days I was little known in the golf world and Braid had already several open championships to his credit. Without a moment's hesitation I said, "Do you always put like that?"

"Yes," replied Braid in his slow methodical style, "and it's the best way too."

By this time I had remembered those championships so I said no more, but I thought a good deal. Braid at that time was considered one of the most unreliable putters amongst the professional players. I was certain that his method of putting was bad, but I just "bottled it up" and kept my opinion for future use.

The next time I saw Braid putting was a year or so afterward in a match at Mid Surrey. I came on the match suddenly, just as Braid came onto the green. I had left another game in which I had no further interest. Braid's ball was about twenty feet from the hole. He studied the lie with his usual thoroughness, then settled himself down to his ball and to my surprise ran it down with a beautiful easy pendulum-like swing, playing the only proper stroke for a put.

I am of course speaking generally now. There are special puts that require certain treatment peculiar to themselves, one in fifty perhaps. For all general use there is one put, the king-put, the put that rolls the ball up to the hole in just the same way as if one rolled it out of one's hand, without spin or cut or anything except an honest roll.

That is the difference between James Braid's old style of putting, when he was very bad, and his present, when he is very good. When he was using his old bad method he was wont to say, and write, that putters were born and not made. Now he uses himself as an illustration that a very bad putter who is using bad methods may, by discarding those methods, become a very good putter.

Vardon's case is possibly more interesting than Braid's. Many years ago there was not much to find fault with in Vardon's putting and he won several open championships. Then his putting went all to pieces and let him down again and again. People wrote long articles about it and showed how it was due to illness, and analyzed the psychology of it, and generally did all those funny things that journalists do to or about people who are much in the public eye.

I happened to see Vardon playing in a foursome at Baltusrol. His putting was sinful. I

had heard how of late years in England he had been missing puts of eighteen inches and two feet, and in America according to the papers he was not much better. Here truly was a mystery.

After what I saw at Baltusrol I had no doubt whatever as to what was wrong with Vardon's putting. He was using a very shallow-faced putter and in addition to that was hitting or stabbing his puts as Braid did in the old, bad days when he never knew what was going to happen on a green.

Vardon's putter was so shallow in the face that he was actually able sometimes to hit the ball beneath the centre of its height, particularly when it happened to be perched up a bit. This meant that often he played his put with the top edge of the face of the club; in effect, a knife-edge on the pimples of the golf ball! Truly an ideal form of putter and putting! Time and again I saw his ball start for the hole with a little crooked jump which was all he had any right to expect.

I saw him miss the simplest of puts so close to the hole that he could have blown them in. His putter had got him down. People spoke with awe of the affection of his wrist. That was a secondary symptom. The root of the disorder was in his mind. He could not understand why his putter would not work for him. It was worse the

nearer he got to the hole, for there the stroke had to be more delicate and this gave the unevenness of the pimples a good chance to play up with the edge of the putter. The further he was from the hole, and the harder he could hit, the better proportionately was his putting, for then the strength of the stroke kept the ball to its direction, but, near the hole, it was really pitiful to see a great player like him missing things a six-year-old boy would have made certain of, whereas one could see that Vardon had done the other thing.

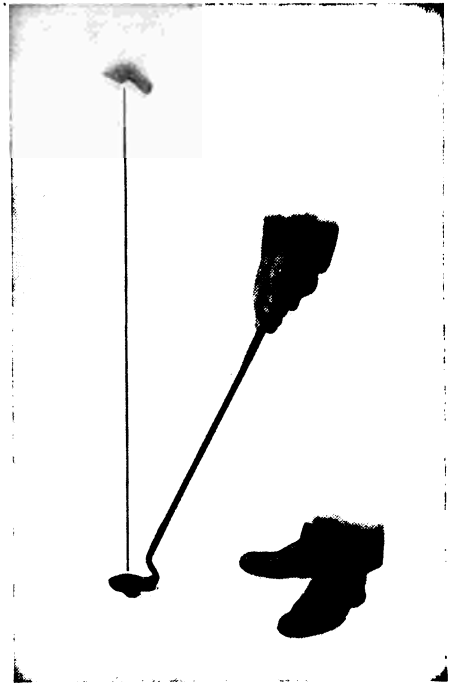
I felt so sorry to see it that I immediately wrote an article, "Why Vardon Puts Badly," setting out what I have stated above, and saying that when Vardon came to realize the truth of what I said and gave up his shallow-faced putter, stopped stabbing his puts, and followed through properly, he would become, like James Braid, a great putter. This was published in *The Golf Magazine*, of New York.

I saw Mr. Ouimet's interesting account of how Vardon won his last open championship. He said he used an old-fashioned upright faced metal putter, and rusty at that, and that he had quite given up stabbing. Mr. Ouimet said that it was his splendid work on the greens that gave him his sixth open championship!

This is a wonderful lesson in putting, especially

for those who are fond of hitting their puts. I have never known a consistently good putter who hit or tapped his puts. The trouble is that with this hitting method of putting one has to rely too much on what, for want of a better term, I call muscular memory. In the other method, where one swings gently and easily onto the ball with a good follow-through, one can regulate the length of one's put with considerable accuracy by the length of one's swing back. Moreover the start of a put is always truer with the swinging put than with the stabbed put. The latter has a great tendency to jump the first few inches as it starts on its way to the hole. This tendency does not exist in the other put which is superior in every way to the put that is hit.

A putter should not have much loft. Some people think that it should have none. Personally I think that a putter should have just so much loft as will enable one barely to see the face of the club when the ball is addressed. The objection to loft in a putter is along the same lines as the objection to the stabbed put. The tendency in putting with a lofted club is to put backspin on the ball and to start it with a jump. Neither of these things is desirable in putting. A putter would be better without any loft if the ball would start as freely as it does off a club with a little loft.



SALIENT POINTS IN PUTTING

(1) The Frontal Address used by most professionals

Note the manner in which the Club is soled

(2) Stance and Address

Note the position of the Feet and of the Eyes in relation to the Ball

The fact is nearly all players hit a slightly upward blow in putting. It is probably very slight but the tendency is there nevertheless. A perfectly vertical face would not give quite such a good start to the ball as does the slight loft recommended. The reason for this is that the club grips the ball and the grass also has a hold on it. These holds endure until something slips. Naturally it is the ball that slips on the face of the club. Then it starts to roll. With a lofted club of the kind indicated the ball is started towards the hole without any conflict such as takes place when a club with a vertical face is used.

I have given the reformation of Braid and Vardon as a useful lesson in putting. These anecdotes should be enough to prevent anyone's trying to put with drag, or backspin, which was practically what the old method of Braid and Vardon meant. Drag has its uses in billiards and misguided persons have repeatedly tried to apply the principles of billiards to strokes on the putting green; and in various articles have endeavored to show an analogy which does not exist. Golf is golf and billiards is billiards. If a player tries to teach one putting by the principles of billiards it is to be feared that he is not a very practical guide to follow.

The conditions that exist on a billiard table and

on a putting green are totally dissimilar, as also is the nature of the strokes. I am aware that this seems to be almost a work of supererogation that I am performing, but it is amazing to find quite a number of people spoiling their putting by trying to put drag on the ball because they know that drag is used at billiards.

Drag is always dangerous on a putting green. I have already given various reasons for that. It is quite foolish even to think of using it in a long put, for the very good reason that a golf ball will not carry drag on a green for more than about a yard. The comparative lightness of the ball and the excessive roughness of the green and the ball as compared with the smoothness of the billiard ball and table, and also the fact that in billiards the blow is concentrated at a point well below the center of the ball's mass, go to show the futility of comparisons of this nature.

There is one case in which drag may be useful. That is in short puts of not more than three feet or so. In such a put the ball may hold its drag against the friction of the green until it gets to the hole. If it does so it has a greater chance of "working in" than the topped put, which often "rims" or "lips" the hole and runs out again. But even here the chances are that the plain put is the safest and the best. Any dragging, stab-

bing or topping of puts is dangerous. All cutting, pulling or slicing of puts is to be avoided, where possible, and it is possible in about ninety-seven per cent. of strokes on the green. There is one put that is the king put, the plainest of them all. One who can use this properly can let any one else have all the others with an easy mind.

Rather than waste time trying to learn how to put with drag one should go to the other extreme and try to put with top, not that this is necessary, but there can be no doubt that a very few good putters do use it to advantage. Most of them get it by hitting the ball as the club is coming up, that is to say, the ball is not hit until after the club has got to the lowest point in the swing. A ball hit thus has more run than a plainly hit put, but although such a stroke is superior to a put with drag, I cannot bring myself to recommend it, for I do not consider it necessary. Many people think that to get top in a put the ball must be hit above the center. This of course is not so. It might indeed be got by hitting the ball slightly below the center, as is often done in obtaining top spin in tennis. The difference, of course, between the put so hit and the tennis ball is that most of what goes into spin in tennis simply goes into extra run when the ball is on the green. Some writers refer to putting top "spin" on a put. Needless almost

to say this is not practicable for the reasons already indicated.

I have already spoken of the false teaching of the most famous professionals and the leading writers on golf. In no case however is their teaching so pernicious as in the matter of putting. They, practically with one accord, declare that putting cannot be taught, that one must be born with the art or one can never get the secret, and then leave the unfortunate learner or golfer to despair. This is simply wonderful. We have seen that putting is at least half the game of golf. I am going to put before you the statement of the three greatest, or perhaps I should say the greatest three, professional golfers of all time, to the effect that not only are they unable to teach the most important half of golf, but that it cannot be taught; then I am going to tell you what I think about it.

Let us see what Braid, Vardon and Taylor have to say about putting. At page 143 of *The Complete Golfer* Vardon says: "For the proper playing of the other strokes in golf, I have told my readers to the best of my ability how they should stand and where they should put their feet. But except for the playing of particular strokes, which come within the category of those called "fancy," I have no similar instruction to offer in the matter

of putting. There is no rule and there is no best way.

"The fact is that there is more individuality in putting than in any other department of golf, and it is absolutely imperative that this individuality should be allowed to have its way."

Following this we have what is possibly the most remarkable statement ever seriously put into a book on golf. Here it is: "I believe seriously that every man has had a particular kind of putting method awarded to him by Nature, and when he puts exactly in this way he will do well, and when he departs from his natural system he will miss the long ones and the short ones too. First of all he has to find out this particular method which Nature has assigned for his use."

Then at page 144 we read that when a player is putting badly:—"it is all because he is just that inch or two removed from the stance which Nature allotted to him for putting purposes; but he does not know that, and consequently everything in the world except the true cause is blamed for the extraordinary things he does."

This certainly is ingenious, but it is not very satisfactory. It does seem rather unkind of Mother Nature, after having "butted into" our golf in this manner, to hide what it is she intends us to do!

We must be patient, however, and see what James Braid has to say. On page 119 of *How to Play Golf* we read: "It happens, unfortunately, that concerning one department of the game that will cause the golfer some anxiety from time to time, and often more when he is experienced than when he is not, neither I nor any other player can offer any words of instruction, such as if closely acted upon would give the same successful results as the advice tendered under other heads ought to do. This is in regard to putting."

This surely is becoming more wonderful as we go on. A little later in the same book Braid informs us: "Really great putters are probably born and not made."

This certainly is not encouraging, but let us have courage, for we shall require it to withstand the cumulative effect of what J. H. Taylor has to add to our already somewhat discouraging information.

At page 83 of his book, *Taylor on Golf,* in the chapter "Hints on Learning the Game," he says: "Coming back to the subject of actual instruction. After a fair amount of proficiency has been acquired in the use of the cleek, iron, and mashie, we have the difficulty of the putting to surmount. And here I may say at once it is an absolute impossibility to teach a man how to put."

This is going from bad to worse, but there is yet worse to follow. Taylor seems so determined to impress on his readers that the teaching of putting is a hopeless impossibility that he proceeds to ram his despairing ideas home in this manner: "Even many of the leading professionals are weak in this department of the game. Do you think they would not improve themselves in this particular stroke were such a thing within the range of possibility? Certainly they would. The fact is that in putting, more than in aught else, a very special aptitude is necessary. A good eye and a faculty for gaging distances correctly is a great help—indeed, quite a necessity—as also is judgment with regard to the requisite power to put behind the ball. Unfortunately, these are things that cannot be taught; they must come naturally or not at all.

"All that is possible for the instructor to do is to discover what kind of a putting style his pupil is possessed of, offer him useful hints, and his ultimate measure of success is then solely in his own hands.

"It is easy to tell a pupil how he must needs hold his clubs in driving or playing an iron shot, but in putting there is hardly such a necessity. The diversity of styles accounts for this, and in this particular kind of stroke a man must be content to rely upon his own adaptability alone."

Taylor has much more of this kind of thing to say, but it is all so false, so misleading, so very disheartening that I shall cut out a great deal of it and give just one final quotation in this particular matter. He says: "Putting, in short, is so different to any other branch of the game that the good putter may be said to be born, not made."

Now here you have the combined wisdom of Braid, Taylor and Vardon with regard to half the game of golf, and that, as Taylor himself says, the more important part of it. They, at time of writing, have between them won sixteen open championships; their profession is to teach and play golf. They absolutely confess that they cannot teach the more important half of it, and they do not stop at that, for they say that one cannot learn it; that one must be born with the accomplishment. To all of which, without any excuse or apology, I say "Nonsense!"

It is just nonsense of the most pernicious character. The same journalist who was hired to put Vardon's instruction into writing had the job for Braid's book. I am afraid this accounts for their strong family likeness and much of the nonsense that is now tacked on to the famous names of the two great players. Possibly Taylor's assistant was influenced in some way by these weird ideas. If this is not so it is indeed hard to see how so

shrewd a man and so good a golfer as J. H. Taylor could allow such futile stuff to be associated with his name.

One will see at once the importance of the matter I have quoted. I am producing, one may say, almost the authority of the world to prove that I cannot teach you putting, that nobody can, that indeed it cannot be taught. If perchance I should fail surely I have soft ground on which to fall; but I shall not fail. I brush aside with contempt and indignation such hopeless nonsense and tell my readers that putting is surely the easiest thing in golf to learn, provided only that one has the patience to carry out proper instructions and to practise. That is the secret of good putting—practise, and practise, and practise.

Above everything forget about Mother Nature having given you a special putting style. That is simply journalistic stuff which Vardon probably never even read. Nature no more attends to such trifling individual matters than she concerned herself with giving me a special style for my niblick shot or my push stroke.

Forget all this nonsense. Know that you may be a good, an absolutely first class, putter if you have two wooden legs and have lost your left arm, though I am prepared to wager that these trifling deficiencies would interfere a good deal with

Mother Nature's plans for your style on the green.

Remember that the first thing in putting is not any question of your style, your individuality, or how you look while you are doing it. Cease to think of yourself at all; or, if you cannot avoid this somewhat popular amusement, try to think of yourself as an old grandfather's clock and your hands as the bearing whereon the pendulum is swinging. Know that if you reproduce, as nearly as you can, the swing of that pendulum on to the ball that in the end the result will be good, for your mechanical efforts will have been right; and it is these that count in putting and not wandering thoughts of failure, putting the blame on Mother Nature, of style and so on. And know that if Mother Nature gave you an individuality worth having, you will graft that on to the proper foundation of the stroke, which is, in the first place, correct mechanics. Know also that, so far as your individuality is subservient to and harmonious with the correct mechanical production of your stroke, it is a right and proper thing to let it edge in and assist to make your form on the green; but remember above everything that the person who thinks of form or style except such as comes from playing his strokes well and truly is no guide for you or me.

It may seem that I deal with this matter in a

somewhat irreverent manner. It is indeed hard to refrain from being serious and severe. It is almost impossible to say how much despair, gloom and despondency has been spread throughout the world of golf by the hopeless message of the great triumvirate on the subject of putting. Golf, as most of us know, is now of almost more importance than religion and politics together. Can one who knows the truth sit calmly by and see untruth needlessly and carelessly circulated to the detriment of a great game without raising one's voice in protest and flashing forth the message of hope and confidence and truth which must take the place of the woful tale of the great three—a tale to which they would not now subscribe their names.

Taylor, Braid and Vardon speak of wonderful "individuality" in putting. If they said "contortions" it might be nearer the truth. It is very strange, but nevertheless true, that a great number of human beings find it extremely hard to be natural on a putting green when in possession of a putter and about to hit the ball.

The trouble is that the grand tale of the mystery merchants has spread. The "gigantic conspiracy," as James Sherlock, the famous English golfer, calls it, is in full operation. Every one who approaches golf is filled up with tales similar to the quotations that I have given from the books

alleged to be by Braid, Vardon and Taylor. That unfortunately is what I have to combat. It is truly some handicap to start out to tell simple honest folk the simple honest truth with such a mountain of prepared and authoritative falsehood to knock down, but fortunately I have some very strong corroborative testimony in support of my argument.

I say "fortunately" because it amounts to this. If you are going to get any good from this book you must believe the obvious outstanding truth and reason of what I say and discard the nonsense associated with the greatest names in the history of the game.

Now, in connection with putting (the more important half of the game, remember), some people might think that I ask too much when I claim to have my teaching accepted without demur against such men as the triumvirate. It does not seem so to me. Names mean nothing to me unless they are associated with the truth. Fortunately, since most of this foolishness was published James Braid has recanted. In his book, *Advanced Golf*, at page 144, Chapter X, dealing with putting strokes, he says: "Thus practically any man has it in his power to become a reasonably good putter, and to effect a considerable improvement in his game as the result."

(3) Swing Back

Observe that the Club has gone straight back and that the hands have barely moved

Follow-through

The Club has followed straight after the Ball, the hands coming slightly forward

SALIENT POINTS IN PUTTING

Here is the right note. This is the message of hope to the golfer and the beginner. Braid here says that "practically every man" can "become a reasonably good putter." I go still further. I should say instead of "reasonably good" "very good." Think what this changed message means to the world of golf. If I had nothing else to convey to golfers, this one lesson of hope and trust and confidence on the green, and my showing that it is justified, would be worth while.

It will be remembered that Braid, Taylor and Vardon are practically agreed that good or great putters are born and not made. The statement is, of course, so ludicrous that one would if the words gave one any chance to do so accept them in a figurative sense. Taylor goes further and says that the best evidence that one cannot learn putting is the bad putting of some professionals. He argues that the fact that they cannot improve is proof that putting cannot be learned.

Fortunately for the people who cannot put we have the two remarkable cases of Braid and Vardon, two great golfers who could not put when they were using wrong methods, but who became good putters directly they abandoned their faulty execution.

Let us see what Braid has to say of his own salvation. On page 146 of *Advanced Golf* he says:

"Of course they say that good putters are born and not made, and it is certainly true that some of the finest putters we know seem to come by their wonderful skill as a gift, and nowadays put with an ease and confidence that suggest some kind of inspiration. But it is also the fact that a man who was not a born putter, and whose putting all through his golfing youth was of the most moderate quality, may by study and practise make himself a putter who need fear nobody on any putting green."

Let me pause here, ye despondent ones, to repeat the words "who need fear nobody on any putting green." This, now, is going almost further than I do.

Braid proceeds: "I may suggest that I have proved this in my own case. Until comparatively recently there is no doubt that I was really a poor putter. Long after I was a scratch player I lost more matches through bad putting than anything else. I realized that putting was the thing that stood in the way of further improvement, and I did my best to improve it, so that to-day my critics are kind enough to say that there is not very much wanting in my play on the putting green, while I know that it was an important factor in gaining for me my recent championship.

"So I may be allowed the privilege of indicating

the path along which improvement in this department of the game may best be effected; and what I have to say at the beginning is, that putting is essentially a thing for the closest mathematical and other reckoning. It is a game of calculations pure and simple, a matter for the most careful analysis and thought."

It would scarcely be possible for any one to eat his own words more fully and effectually than this. We may, I think, take it, as this is in Braid's most important work, *Advanced Golf*, and as this is, so far as I am aware his last word on golf, that we now have his mature thought on this most important matter. The wonderful thing is that although Braid recants in this whole-hearted manner and gives himself as an instance of a very bad putter who worked out his own salvation, indeed goes so far as to say he may "be allowed the privilege of indicating the path along which improvement in this department of the game may best be effected," he gives us not the slightest clue as to how his reformation was effected. That would indeed have been a pity unless I had happened to see him putting in his old bad days. I have already told what it was that saved James Braid from remaining a bad and unreliable putter.

There is another brilliant player who suffers from the same fault, or perhaps I should say, who

did when I saw him play, for it is years now since I saw him tap a put. That is George Duncan. Like many who tap their puts, Duncan on his day is a wizard; but there is another side always to the tale of the man who will not follow through in putting; and I am inclined to think that in times of severe nervous tension, as when a man is laboring under a great match strain, the tapping or stabbing of puts must of necessity be a more dangerous game than leaving all that is possible to the club as one does in the true method of putting.

I have spoken against putting with drag, especially for long puts. It is obvious that a golf ball at rest sinks into the turf for quite an appreciable space. The area of contact between turf and ball is a considerable part of the surface of the sphere and not a point as it would be on a glass table. It stands to reason that if this ball is rolled slowly toward the hole it will depress the sward approximately to the same extent all the way to the hole. In other words its groove is holding it to the line it started on. Now if the ball is started by any kind of a blow that makes it jump from the green one immediately introduces into the roll of the ball a new element of risk, for it is impossible to say what it will meet when it comes down and how it will meet it, for, unless the put is a very strong one, stalks of grass, twigs and pimples have more than

a theoretical effect on the run of a golf ball. For this and many other reasons, some of which I have given, there is no put superior to the plain put.

In putting, the feet should be kept fairly close together and the ball addressed so that it is about midway between the feet, if anything slightly forward of the midway line. The best criterion, however, for the right place in which to find the ball in relation to the feet is: Does a line from the bridge of the nose fall plumb onto it? It is quite possible to dogmatize too much as to how one shall stand when one is putting. Much depends on one's physical conformation. Photographs give one a good idea of the methods employed by the leading players and they are a very valuable means of instruction. Examine not one or fifty, but mayhap hundreds, then again and again, about all points on which you require enlightenment. They will infallibly assist you in time.

Generally speaking, in putting one stands with the right foot almost at a right angle to the line of run to the hole and the left at about an angle of forty-five degrees to the right, but here again I shall not attempt to dictate. What I say is good—generally. It should suit you. It may not do so. Vary it slightly until it does. It is not in the minor matters that we must be strict. It is in fundamentals that we are adamant.

In all putting one should so far as possible confine the movement to hands and wrists until after impact. In the follow through, the hands and wrists and forearms must go out after the ball; otherwise there is a great chance of hooking—I do not mean pulling—one's put. In approach puts one cannot rigidly adhere to the rule about confining the action of putting to the hands and wrists; and as a matter of fact, there is less of it in short puts in practise than there is in theory; but it is the right idea to inculcate, for the more we reduce the wrists to one bearing (as in the pendulum) the greater delicacy and accuracy shall we get.

Standing with the feet together is quite important in many cases. It is not essential. If one is putting well enough to do all one wants, one need not alter one's style. If, however, one is swaying, one should at once put the feet more closely together, as it makes swaying almost impossible.

It is of the greatest importance to think of nothing but getting the ball into the hole when one is putting. There is, one may say, judging from the amount I write of putting, a great deal to remember. There really is not. I write in great measure of the things that one must know but must forget, or at most use sub-consciously, when one is playing. Above everything be natural. Never

fall into a cramped position. Never worry for a moment about which hand is doing it or when the pressure of a certain finger comes in. All this kind of thing is nonsense and calculated to retard your development instead of to assist it.

If, however, the result of your stroke is not what it should have been, I have no objection to your holding an inquiry into it provided you do not go into it on the course and delay and annoy people who are following you.

I have said that there is, for all practical purposes, *one put*. That statement will hold good; for even when one is stymied, in the great majority of cases one can get some assistance from the green and so get into the hole around the obstructing ball without playing other than a plain put.

There are, however, cases in which one must cut or pull round the obstructing ball. These are strokes which are better taught on the green than in a book. One must have a club suitable for them and one must know the green on which one is playing. A simple cut, or "sliced" put, will run round a stymie with a lovely curl from one side of the hole. Try it from the other side and the result of the stroke is quite different. The "nap" of the green, otherwise the way the cutters have laid the grass, is entirely opposite. It is impossible to speak positively about the effect of cut puts or

pulled puts on a putting green; for we are not, as in billiards, dealing practically with known quantities. No two greens are alike. No two "runs" to a hole have the same characteristics when it comes to a question of such nicety as introducing spin; so one must be content in these matters to get one's experience mainly by practise, and, if one is keen enough, the study of books which go fully into such matters.

It must not be thought because I pass them by like this that I think these matters unworthy of study. If a man really loves the game he should know them. He may not want them five times in a lifetime, for generally there is another and an easier way out of the difficulty, but sometimes there comes the position which demands one shot and one shot only. That is the time your true golfer wants to have it in his repertory.

Many books give much advice about putting uphill and down-hill, across hill, and everywhere, except perhaps in the subway. Their authors tell you about getting great results by using the toe and the heel and other funny bits of the putter. There is just one part of the putter to use for putting, and that is *the middle of its face.* That may not be geometrically correct. Here is another instruction that is probably less so, but still to you expressive and explicit. Use only the center of

your club-face. Don't think of toeing or heeling anything. You will never be so good a golfer that you can do anything off the toe or the heel of your putter that you cannot do equally well, or better, with the center of your club.

In putting one must rivet one's attention on the ball and keep it there until one has played one's stroke. Starting to practise near the hole, one has not the same desire to relax one's attention and to follow the run of the ball as one has if one starts far away from the hole or by driving. In these cases there is always a great tendency on the part of the beginner to look up. This means moving the head and unsettling the stroke. It is a fault of the worst description that must be most persistently fought.

No advice about putting would be complete without a reference to the golfer's outstanding sin on the green. One should make up one's mind always to "give the hole a chance;" in other words, one should always put so strongly that, unless one goes into the hole, one's ball either stays opposite the hole or rolls past it.

We see frequently in books advice to search out some particular blade of grass on the way to the hole and to put over it. For sheer futility this always seems to me to be entitled to a very high position. There is a wonderful family resem-

from the ball inward to the player the moment it leaves the ball. The only put possible as a pure wrist stroke, that is playing it without moving the wrists from their position, is a put played by a putter with a perfectly vertical shaft, and we know that these are not used.

The ordinary putter shaft, as is well known, lies in toward the player at a considerable angle. The only way to carry out Vardon's instructions in putting, and to keep the head of the putter "exactly in the line of the put," is to allow one's wrists in putting to travel with the club. This one *must* do on the *backward swing as well as in the follow-through.* Any attempt to put in any other way must result in bad form, that bad form which comes from the neglect of obvious mechanical necessities, and therefore the worst kind of bad form.

Vardon has some other advice to give that is worth noting, but not following. He says: "In the follow-through the putter should be kept well down, the bottom edge scraping the edge of the grass for some inches." I am quoting this because here again we see the impossibility, with any ordinary putter, of making the follow-through without letting the wrists go, and moreover the instructions for "scraping the edge of the grass for some inches" mean playing the put with the

(1) Cocking up the Toe

(2) Cocking up the Heel

(3) Turning the Face of the Club forward

(4) Cocking up the Face

ERRORS IN PUTTING

descending blow, the old, faulty method which Vardon has fortunately abandoned.

In those days Vardon argued in favor of the stabbed put. He said: "It is easy to understand how much more this course of procedure will tend towards the accuracy and delicacy of the stroke than the reverse method, in which the blade of the putter would be cocked up as soon as the ball had left it."

Is not this strange tuition? What is more natural than that the face of the club should be cocked up as soon as the ball has left it. Let us affix our ideal putter head to the pendulum of the clock and let it play the put. We shall of course see that the face of the putter begins to cock up the instant the ball has left it. This is as it should be, as indeed it *is*, in the vast majority of all golf strokes, excluding of course those which come within the class known as "push" strokes.

Any one who is trying to put with cut must remember what I have said about trying to do anything to the ball during impact. Vardon says: "Swing just a trifle away from the straight line outwards, and the moment you come back on to the ball draw the club sharply across it."

There must be no attempt in putting to do anything "the moment you come back on to the ball" that was not an essential part of the arc of the

swing as determined by the player the moment it was started. The fact that the club encounters the ball is an incident in the swing, but the arc of that swing having been once settled cannot be readjusted successfully nor altered in any way as a matter of good and consistent golf. This idea of doing something to the ball while the club is adhering to it must be absolutely abandoned.

Much might be written about putting on undulating greens, but here I am sure the green is better than all the books ever written. There is, however, one broad general piece of advice that I shall give to players when allowing for the run of the ball in putting across a ridge or ridges or on the side of a hill, and that is "Always allow plenty."

The golfer's cardinal sin on the green is being short, not "giving the hole a chance." It is nearly, if not quite, as bad to be narrow, for in this case you throw away any chance you may have of holing out, and on a down-hill run once the ball gets away from the hole it often means a long up hill journey.

CHAPTER V

THE MASHIE

We have now finished with the putter for the present. Naturally we look for the next stroke. It is the shortest stroke that we have to play with a mashie. That is a stymie near the hole.

Quite frequently, on account of the defective construction of the mashie, a niblick or a mashie niblick is a better club for this shot than an ordinary mashie. For the most delicate work on the green it is however obvious that these clubs are too heavy. The fact is that the modern golfer has not in his bag a club really suitable for playing short stymies. A special stymie mashie is required. It should have about the loft of the niblick, the same angle of sole with the face so as to give the sharp edge to go in under the ball, about the same weight as an ordinary mashie, if anything a little lighter, and *no marking whatever* on the face. In addition to this the sole should start curving up a very short distance from the face.

The ordinary mashie has a sole that is too broad. It is so broad that frequently when one turns its

face back a little to get under the ball the back edge grounds first and so, cocking up the front edge, robs the stroke of any delicacy. If the sole is run off at an angle like a niblick and then quickly curved upwards it improves the club considerably. Also it must be remembered that many cut shots, especially with back spin, are played with the mashie. The amount of spin on the ball is regulated by the pace at which the club passes it. An unduly broad sole on the club cuts off the pace directly the club touches the earth much more than the curved sole does.

I had one particularly serviceable little mashie of this type once. Stymies had no terror for it. I showed it to George Duncan and dwelt particularly on the importance of the curved sole. Duncan told me that he always had the back edge of his mashies rounded off.

I have said that a stymie mashie should have the face perfectly smooth. Unless I had found this out in the most practical way I should have doubted it. One can get a more sudden rise with a smooth faced club than one can with any club that takes a grip of the ball whether it be by lines, dots, holes or otherwise.

My light mashie taught me this. It had a perfectly smooth face. I had a shot with it that I often set up as an exercise for people who thought

they could use their mashies on a stymie. I put one ball half an inch from the hole and the other six and a half inches away from it—a dead stymie. Sherlock says it is the hardest stymie in the game. Certainly it is not the easiest. With my light smooth-faced mashie with the curved sole I could get this shot three or four times in succession. One day I took it into my head that perhaps I could play the stroke better if I got a better grip of the ball with the club. I had the face of the club covered with a thin film of soft solder. It ruined the delicacy of the shot. With a smooth-faced club the ball starts running up the face directly it strikes the club. With a marked club it grips more and stays lower. That is why a smooth-faced club is better for a sudden rise. I had never thought of it in this way before but probably the same holds good of the niblick; in fact, it is almost a certainty that it does.

I obtained a fine grip with the soft metal facing. I am inclined to think that this idea is superior to rust and it certainly looks much better. There can be no doubt that some better medium of contact is wanted between the iron clubs and the ball than now exists. The chalk for the cue is missing. This soft metal may supply it.

We must now consider the best way to play the stymie that I have set up. This is by means

of a stroke that I introduced into golf myself. I had known it for many years, but I first published it in 1908. George Duncan was the first professional to whom I showed it.

What Duncan cannot do with a mashie is hardly worth troubling about. The enforced idleness of a wet Saturday afternoon led to my "putting one over" on him. The rain was coming down in tanks. I was filling in time knocking a couple of balls about the mat in Duncan's shop at the Hanger Hill Club. I started practising stymies. Presently I said, "How would you play this stymie, George?"

"Just in the usual way," said Duncan.

I set it up for him then, and he played it "just in the usual way."

"They all play it like that, don't they?" I said.

"Yes," replied Duncan.

"Then it isn't the best way," I replied; "I'll show you a better."

Duncan's face moved a trifle, but he smothered the smile, and I showed him the stroke. He was on to it like a cat after a mouse. As he said afterwards, it isn't every day that any one teaches him a new stroke in golf. He got it after a few tries, and then he could hardly wait until the rain stopped to get out on to the green.

The essential difference between my stroke and

the old stroke is that the regulation stymie stroke is, like every stroke in golf, an arc. My stroke is a perfectly straight stroke. It goes back parallel with the green. This is all the difference, but it means everything in delicacy, in accuracy, in quick rise and sudden stop.

It is almost incredible, yet is the fact, that many people said that this was a foul stroke when I published it first in *The Daily Mail,* London. Others were equally sure that there was nothing new about it, that in fact it had been played since golf was golf!

The difficulty in teaching this stroke to any one lies in the fact that from time immemorial, even in the shortest put, the moment the club came away from the ball it began to ascend in a curve. One may, and often does, keep the club low; but the curve, or arc, is always in the stroke. In my stroke *there is no curve.* Right throughout the stroke, swing back, swing forward and follow through there is no curve. The line of travel of the club's head is as nearly as may be the same as the green.

There must be no idea of hitting the ball or of taking turf. The endeavor must be to insert the front edge of the mashie sharply between the ball and the green. The result of this is that far less force goes into *propulsion* and much more into

elevation than in the ordinary stymie shot where the ball is frequently hit as the club is coming up. It seems curious to many people, but it is sound golf nevertheless, to warn one against trying to get the ball up by hitting up. The great secret of getting a ball up well is to hit down enough. So in this delicate shot the straight travel of the club head is much better than the curved movement of the ordinary stroke.

There is a marked peculiarity about this stroke which should have been enough to show any one that it was very different from the regulation stymie stroke. On account of the blow not being an arc the hands are forced to move parallel with the head of the club as the stroke is being played.

It is very hard to wean golfers temporarily from the arc, or ordinary golf stroke. In teaching this new stroke to quite good golfers I have put down a match a few inches behind the ball and the same in front and said, "Now go back in a straight line to that match, so that the middle of the sole of your club is over it, and then go smartly forward to the other match without raising the club. "Even then I have had them raise the club on the ball, and come down for the finish, but that of course had spoiled the stroke.

George Duncan, after full experiment with this stroke, refused to be photographed for *Modern*

Golf, playing the ordinary short stymie stroke, for he asserted that my stroke had put it out of date.

One of my critics in England stated that a full description of this stroke could be found in any book on golf. In *Advanced Golf,* in describing how to pitch over the obstructing ball, James Braid says: " . . . it is just an ordinary chip up, with a clean and quick rise, the fact being remembered that the green must not be damaged. To spare the latter the swing back should be low down and near to the surface, which will check the tendency to dig. The thing that will ensure the success of the shot, so far as the quick and clean rise is concerned—and often enough success depends entirely upon that—is the follow-through. Generally, if the club is taken through easily and cleanly, all will be well."

Could anything be more unlike the description I give of my stroke than that? With my stroke one cannot damage the green, for one moves in a line with it; also the hands follow the head of the club back and forth, which they do not in an ordinary shot; while the thing that "will ensure the success" of my stroke is not the follow-through but playing the first part of the stroke, up to and including impact, in the manner I mention. It is curious to see here again the persistent error about

the follow-through affecting what has gone before. It is curious also to see no reference to the importance of the low follow-through, which is not, be it remembered, important in itself, but merely so as an indication that what went before was correctly done, and for its effect before the stroke was played—if one may put it so—in determining the arc in which the club head was to travel, since the player must have decided that he would play his stroke in such a way that his follow-through would be low.

In this stymie stroke—I speak now of the one Braid is describing—the club may be "taken though easily and cleanly" every time, and yet the stroke may be an utter failure. Much more depends on the attention that is paid to elevation and keeping the club down so as to give the loft a chance to fulfil its function, which is to lift the ball.

Many players, even quite experienced golfers, forget that their duty in the vast majority of strokes is to hit the ball and that the loft will do the rest. This is not of course true of some strokes, but it certainly is of the vast majority. More strokes are ruined on the golf course by hitting upward, by neglecting to trust the loft, than by anything else.

It is not altogether curious that this is so. In nearly every other implement with which man hits

a ball into the air he makes his own loft by the manner in which he turns his striking implement on to the ball. I believe that golf is the only game of any consequence wherein the player strikes a direct blow towards the desired goal and leaves the matter of trajectory to be automatically settled for him by the angle at which the face of his implement is set. It is not therefore surprising that this fault of hitting upwards takes some fighting. Women are particularly prone to this error. In many cases it would be a good idea to put, three inches in front of the ball, a small white peg three quarters of an inch or so in height and to tell one's pupil that she must not only play a good drive or cleek shot but that she must also go on and cut down the peg in front of the ball in the follow-through.

In marked contrast to the manner in which ignorant persons received the new stroke in England was its reception by America's leading player, Mr. Jerome D. Travers.

I was talking to one of the directors of a large sporting goods house in New York one very hot day, when Mr. Travers came in, and he introduced him to me.

"Jerry," said he, "Mr. Vaile will talk the theory of golf with you by the day, hour and minute."

"Not on your — life, especially on a day like

this," I said; "but," I added, "I'll do something better than that. I'll take Mr. Travers out to your putting green and teach him a stroke he doesn't know."

"That sounds all right," said Mr. Travers, and without any delay we went out to the putting green, where I set Mr. Travers up the wicked little stymie I have mentioned.

"Can you get in there?" I asked him.

"No, I'm pretty sure I cannot," he said; and off an unyielding floor it is not too easy.

"If I do it three times running, do you think it's a shot worth learning?"

"Certainly I do" said the open champion.

I dropped my ball in three times and the famous little golfer took the club and got right down to work. He was not bothering to decry the stroke, to call it foul or old because he didn't know it. He saw me do it. He knew it was useful He wasted no time. He learned it. This incident is typical of the American's mental outlook. He is always ready to take up anything new and good. He may, like our Missouri friend, want to be shown; but if one tells him something he does not know he does not take it as prima facie evidence that one is a fool, a theorist, a faddist or a revolutionist. In England this is a very common error. The mentality of the ordinary Englishman, in England, is

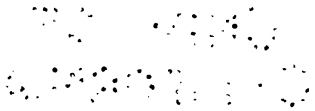
The Right Loft for a Putter
More than this is dangerous

The Shallow Putter
Note the danger of its getting under the Ball.

The edge of the shallow-faced Putter is liable to get under the Ball

The Putter of proper Depth does not get under the Ball

COMPARISON OF PUTTERS



not very alert. Small wonder, for it is never stimulated. The consequence is that he views any new thought with suspicion, for it is something that may tire, nay, even bore, him.

I have shortly referred to the merits of this particular stymie shot. I have I think dwelt sufficiently on its remarkably quick rise which is so often "of the very essence of the contract," as the lawyers say. There is another point that in a stymie is often equally important and that is in checking the run of the ball, after it has pitched.

I have shown how in this stroke more force goes into elevation and less into propulsion than in the ordinary stymie stroke. That in itself tends to give the ball a deader drop with less run than the ordinary stroke has; but in addition to this we must remember that in this stroke the blow is struck by a club that gets in under the ball as far as is practicable and hits it just as low down as it is possible to hit a golf ball in practical golf. It is the nearest thing to a scientific jump shot at billiards that can be put onto a putting green. The consequence is that the ball takes more true back-spin than in any other stymie stroke that is played, and it is therefore possible to jump some stymies and yet to control the run of the ball in a manner that would be impractical were one to use the

this attraction and then you will find that you get quite as much success as you have any right to expect with a shot of this kind.

We have now to deal with the ordinary chip shot. This as you know starts at the edge of the green. It seems obvious that you ought to slide into it almost without knowing it. Your last approach put was only a foot shorter than this shot you are trying now. What is the difference? You will stand up much straighter, which is natural as your club is a little longer. Your stance is more open. Your right foot is nearly at a right angle to the line to the hole, and your left foot points more towards the hole; in fact, your feet are nearly, but not quite, at a right angle. Your knees are almost stiff; that is to say, they are barely flexed, and both your feet are, and during the stroke, remain, in full contact with the earth.

The ball is taken opposite the right heel. The weight is fairly equally divided with an inclination to have slightly more on the right foot than on the left. As in the put the feet are kept close together. The swing back comes mainly from the forearms. One must guard against imagining the wrists into this stroke. Strive above everything else to hit the ball so that the front edge of the club is at a right angle to the line of run to the hole and finish your stroke with it in that

position. It will seem as though this makes one play a constrained finish. It will cause one, in the finish, to point one's left elbow at the hole. If these two items are kept in mind one's direction will never be very bad.

One could fill reams of paper instructing one's readers in the various kinds of mashie strokes, cut shots and run up strokes and how to swerve and run and so forth. These are all very useful and much that is quite fascinating may no doubt be written about them, and in its right place I hope to have something to say about the general principles of the flight of the ball and how it is influenced by spin and other factors. I am satisfied in the meantime to leave this subject, for I am convinced, more now than I was in 1909, of the importance of back-spin in golf, even as top-spin reigns in tennis. I have already in some small way referred to it and it will recur again and again in such a manner that I hope my readers, without being wearied by what really is a somewhat abstruse matter, will get all the practical and interesting portion of the subject that has a direct bearing on their game, as well as directions as to the best way to produce back-spin.

One of the greatest secrets of success, with the mashie particularly, although this applies to all iron clubs, is to keep the swing as upright as pos-

sible; that is, to have the head of the club as nearly in the plane of the ball's flight for as great a time as possible while the stroke is being played and in the follow-through.

There is one thing I must impress on my readers and that is that it is not necessarily a sign that one is master of the mashie because one carves bigger divots than any other member of the club. In the old days the divot was of more importance than the stroke! Hit your ball as cleanly as you can whenever the lie will allow you to do so. What you do to the turf should always be merely an incident of the stroke. I condemned this practise in *Modern Golf*, pointing out that agriculture does not rightly form any part of the great game of golf and should not be unnecessarily obtruded therein. The greatest masters of the mashie are much more merciful to the turf now than they were formerly. Of course there will be shots when you must dig your ball out. Then it is no question of half measures; but, generally speaking, don't hit the earth unless you need to do so. Vardon has altered his method a good deal in this respect of recent years.

CHAPTER VI

THE IRON

THE iron is used when the shot is beyond the range of the mashie. About eighty yards is all that one should, generally speaking, ask the mashie to do. Above that one should use the iron until something of greater capacity is required.

It is always well to try to get one's results from a club that has the work well within its power in preference to forcing another club to its limit. It stands to reason that one keeps greater command in this way.

The same rule holds good as between the iron and the cleek. A half or three-quarter shot with the cleek is frequently much better than a full shot with the iron.

I have already spoken of the importance in all iron play of standing well over the club. Of course the nature of the clubs themselves in some measure compels this; but it is a point of great importance, and as a player begins to understand his clubs a little better he should gradually start trying to

consider the finer points in their make and their adaptability to his style and build. As a general rule the nearer one gets to the hole the more one must stand over one's club until when one has arrived on the green one is found addressing the ball so that a plumb line from the eye will drop right on to the ball. This in itself is a strong argument in favor of keeping in as close to one's work as practicable; for the greater the demand for accuracy becomes, the more one's desire to get one's eye into the line is seen.

The stance for the ordinary iron shot is not quite so open as for the mashie. I have in the chapter on gripping and soling referred specially to the importance of allowing the club to take its position naturally so that it lies on its sole from heel to toe and is neither cocked up on the heel nor put down by the toe. These are two grave errors. Possibly the worse is to be down by the toe. If one takes turf too heavily by the heel one is more nearly in a line where the power is developed, to wit, by the shaft, but if one happens to put the toe of one's club into the earth during a stroke, that is the end of it. The leverage at the end of the head being so much greater causes the shaft to turn in the hand, thus laying the face of the club back and irretrievably ruining the stroke.

The nature of the swing in using the iron must

be learned from carefully studying the photographs and the explanation of the golf stroke. The regulation of one's distance is obtained by the length of the swing back. To put it in another way, when you want a shorter distance chop off some of your swing. This would apply in the case of the ordinary tuition where the drive is taught first. In this case you are being asked to add to your length of swing and you must do so in all ways in conformity with the general principles laid down in my analysis of the golf stroke.

In speaking of the iron shot Vardon says in *The Complete Golfer*: "When a few extra yards are wanted, put an additional inch or two on to the backward swing, and so on; but never, however you may satisfy yourself with excuses that you are doing a wise and proper thing, attempt to force the pace at which the club is traveling in the downward swing, or, on the other hand, attempt to check it. I believe in the club being brought down fairly quickly in the case of all iron shots; but it should be the natural speed that comes as the result of the speed and length of the upward swing, and the gain in it should be even and continuous throughout."

I am afraid that this idea of even and continuous acceleration of speed would if followed out upset the iron play of most people, especially if a

consideration of the upward swing is also allowed to obtrude itself into the downward swing. I cannot say too often that whether it is with the iron or any other club there is only one thing to think of when one has arrived at the top of the swing and that is of hitting the ball. Absolutely nothing else must be on one's mind. Nothing else is practical golf. I should not even excuse one for thinking of my directions! When at play the less one thinks of the book the better for one. That is how too many people abuse books. They stand in front of a little ball that they want to hit. Some one has written a chapter of ten thousand words on that one little thing and how to hit it with a driver. Of what use is that chapter *at that time.* Almost none! Part of it may be actively useful. Part of it may be sub-consciously used. Much more of it may be used in the study that night after dinner, and with a high-ball and a cigar to tone it down, to explain what was wrong with the stroke; and some of *that session* will be actively useful or sub-consciously used next time you go on to the links; and so on and so on until one gets too old or too wise—or dies.

There is something else that Vardon has to say about the swing in the iron shot that seems to me to merit consideration. This is it: "Try, therefore, always to swing back at the same rate, and to

come on to the ball naturally and easily afterwards. Of course, in accordance with the simple laws of gravity and applied force, the farther back you swing the faster will your club be traveling when it reaches the ball, and the harder will be the hit. Therefore if the golfer will learn by experience exactly how far back he should swing with a certain club in order to get a certain distance, and will teach himself to swing to just the right length and with always the same amount of force applied, the rest is in the hands of Nature, and can be depended upon with far more certainty than anything which the wayward hands and head of the golfer can accomplish. This is a very simple and obvious truth, but it is one of the main principles of golf, and one that is far too often neglected."

What is "simple and obvious" to one person is a deep and hidden mystery to another. I think that this quotation is somewhat involved and misleading. Gravity and Nature with a capital N should be left out of the calculation in every way.

Here we only have to consider golf and art employed to assist us in using our natural advantages, or disadvantages; but the moment we begin to cumber our minds with such things as gravity and a personified edition of ordinary human nature we are splitting up our attention

and intention more than is good for the iron shot.

First, as to gravity, forget it. One can use the good old pendulum stunt to illustrate the put because it is a perfectly sound example. I have seen Braid putting at such a rate that any respectable grandfather's clock could give him six inches start and then beat him to the ball. As a matter of purely practical golf there was even then much more of applied muscular force and command than gravity in the stroke, but gravity is useful as an example in putting and can be shown to develop power enough to do what is wanted on the green; but to talk of it as being in any way a considerable factor in the iron stroke is merely to make words and cloud the issue. If any one thinks otherwise swing an iron on a bearing and let gravity do its worst to a golf ball by lifting the club to the top of the swing and letting it fall against the ball. Gravity is a well established and venerable institution but the pace of a modern iron shot renders it absolutely unnecessary for us to give it any place whatever in our consideration of this stroke.

This is not merely captious criticism. It has a basis of very important practical golf behind it. If one permits any idea whatever of gravity taking any part of the command in the head of the club, it stands to reason that the influence of that

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Stance and Address for Putting

Finish of Put

thought must be in the direction of making the iron stroke a sweep, which it most distinctly is not. Even James Braid, who in some places goes "right out" for the sweep notion, refuses to father it for the iron clubs. He says the stroke herein is a hit and the player must remember that.

It is of course of great importance to try to regulate your length by the length of your swing. It is of equal importance to try always to use the same amount of muscular exertion so that you may have one constant factor in your play, but any idea of leaving any part of the iron stroke to "Nature" is surely as futile as waiting about for Mother Nature to declare what kind of a putting style she means you to use. Moreover, even if one does accustom oneself always "to swing to just the right length and with always the same amount of force applied," the rest is not "in the hands of Nature."

These flowery and general statements are of no earthly use to any one who is seeking practical assistance in golf. They annoy me because they are so utterly different from what Harry Vardon would himself tell one. He would talk golf to one in his simple, straightforward, sportsmanlike manner. Instead of trying to leave you in the gloom with Mother Nature he would tell you that after you have obtained control of length and

strength of swing there is much that remains to be done; and that it mainly depends on your own common sense and application, and that if you leave it to gravity and Nature you will never be able to play an iron shot.

CHAPTER VII

THE CLEEK

THERE is not much difference in the swing for the cleek and that in the drive. The main difference is perhaps that it is more curtailed. The grip is also practically the same. In using this club, indeed in all iron clubs, one should grip very firmly with both hands. This may seem superfluous advice after my emphatic directions on gripping and swinging in the drive, but it is impossible to overemphasize the necessity for this with the iron clubs. One so often meets with a good deal of obstruction at and about the moment of impact that unless one's mind is specially prepared to fight it one's grip is found wanting, the club turns ever so slightly in the hand, and the stroke is ruined.

In the cleek stroke, more, possibly, than in the drive, will be found the importance of my instructions as to the distribution of weight at the top of the swing. It is of the greatest importance in the cleek shot that one keeps down to it. One must address the ball with the sole of the club quite

parallel with the turf and must see to it that during the stroke the club passes the ball in almost exactly the same position as that in which it was laid to it in the address. Keeping the main portion of the weight on the left foot in the manner described by me is a wonderful assistance in this respect.

This is new doctrine to many players. It has already proved the salvation of many. It was called revolution when I first taught it. Now, many of them are going too far to the other extreme. Avoid that, for it is almost a worse error. In describing the push stroke, one journalist, writing a book for some one, says that at the top of the swing the weight should be on the left big toe. Poor toe! If you have anything from seven to fourteen pounds more on your left than on your right foot you will be doing better than if the balance is the other way.

James Sherlock weighs less than one hundred and forty pounds, or did when we were trying out the famous weighing machine experiment in London. At the top of his swing he had about seven pounds more on his left leg than on his right. He uses his left foot in the manner I advocate. Not long ago a writer in America tried to show that what I was saying was impractical and was not even in accord with Sherlock's own practise. He

took a photograph from Sherlock's own contribution to a book on golf which showed Sherlock at the top of the swing and the weight very much on his right with his left toe merely touching the ground. That would have seemed bad but for the simple fact that Sherlock learned the truth *after the book was published,* and assisted in the demonstration willingly although it did—as the American writer said—show teaching contrary to that of his photograph; but even in that book, Sherlock, in his writing, advocates even distribution of weight at the top of the swing, and I am satisfied that anyone who consistently aims at that will not go far wrong; for in that event it will be hard to avoid that slight excess which effectually pins one down on to the left foot and is so useful, particularly in the cleek shot, in assisting one to keep the club low down in the impact.

In playing the cleek shot, as indeed in all strokes with iron clubs, it is of the first importance to get an easy yet firm action. Firmness and intention are of the essence of all iron work. This makes one statement of Vardon's about the swing in the cleek shot almost incomprehensible to me. He says: "When pivoting on the left toe, the body should bend slightly and turn from the waist, the head being kept perfectly still. Thus it comes about that the golfer's system appears to be work-

ing in three independent sections—first from the feet to the hips, next from the hips to the neck, and then the head."

This seems to me to be a most unfortunate idea to put into any one's head. In a properly conceived idea of the cleek stroke it is absolutely impossible to separate the body at the hips into two "independent sections." It is the wonderful hip movement founded on his fine foot-work, built up as I have indicated, that accounts for Vardon's perfect rhythm in his drive.

This description of the swing reminds me of a golf toy I patented some time ago. I took a figure of a golfer addressing the ball and cut him downward vertically at the neck and the hips. I then pivoted the parts together. I was thus enabled by drawing back the golfer's arms to make him put by gravity, but when I wanted him to play an iron shot his body engaged a spring which found some more force. Even in this toy the iron shot wanted more than gravity. The head remained still until the follow-through, when a pin engaged it and it turned forward with the body. After the stroke was played the figure behaved very much like many human golfers and proceeded to try the stroke over again with sundry wags of the head and downcast looks, as a matter of fact, quite a natural

little golfer except that he was divided into "three independent sections."

Any attempt to get an idea of "three independent sections" or, so far as that goes, any one independent section of the golfer during the cleek shot is so bad, so untrue, so unlike real golf that it should be discarded utterly. The hip movement, instead of separating anything, is the wonderful joint that keeps everything together, that allows the left knee to go forward and a trifle inward towards the ball, that permits of the left hip following it and sets up the reciprocal backward movement of the right hip that tautens and braces the right leg to such an extent that, in Vardon's swing, the pressure on his right foot tends to be more on the right side of it than on the ball of the toe.

One must avoid any idea of working in independent sections in the golf swing. This same idea has been exploited as regards driving. It is bad golf and bad mechanics; moreover, it is somewhat of an exaggeration to speak of the head "working" as an independent section. It is no doubt performing its most important function but any one who thinks that the rest of his body is working independently of his head—and what's in it, or ought to be—is perhaps right. He ought to be the best judge. But if he is right, let him save his

money and time and find some other game, for in that event he can never be a golfer.

I have emphasized the importance of keeping down to one's stroke in the cleek shot. Vardon is quite pronounced on this point. He says: "And remember that when you pivot on the left toe, the lift that there is here should not spread along to the head and shoulders, but should be absorbed, as it were, at the waist, which should bend inwards and turn round on the hips."

What you must "remember" about this critical part of a stroke that troubles so many people for a reason they never suspect, wrong foot-work, is that the proper "pivoting" (as it is so commonly mis-called) has no "lift" whatever in it so that there is nothing whatever to "be absorbed, as it were, at the waist." The proper foot-work, which I so minutely explain, tends to do the opposite to lifting one away from the ball. It really is the most wonderful cure for this very bad mistake as it keeps one pinned down to one's work.

CHAPTER VIII

DRIVING

THE drive in golf as played by the most finished players, really is a somewhat complex stroke. Without in any way joining the ranks of those who seem to see something mysterious in everything associated with golf I may go so far as to admit this.

Whether it is necessary or even advisable for the vast majority of golfers to attempt to mold their form on that of Braid, Vardon, Taylor, Ray, and Duncan, some one or a composite of all, I am not prepared here to argue. It must be remembered that these great players came into the game when they were very young and that use is second nature with them. Obviously it would be futile for some one over middle age, very stout and short, to try to start golf with a swing like Vardon's. It is practically a certainty that for such a person a much shorter swing and much less foot and ankle work would be advisable. Our duty here, however, is to go into the question of driving and to endeavor to make this somewhat complicated opera-

tion seem as simple as it should to any one who will take the trouble to master it in detail.

Stance and address.

"Stance" means in golf the way in which one stands in relation to the ball as one puts one's club down near the ball preparatory to hitting it.

In addressing the ball one usually rests the club on the ground close to the ball and behind it. This is not permitted when the ball is in a hazard. The club may not then be grounded.

The stance which is most generally favored now is what is called the "open" stance. This means that in facing the ball the player's left foot has a greater tendency to point towards the hole than in the square stance which was formerly most popular. In the square stance, still used by many good golfers, the player stands so that a line across his toes would be nearly parallel to the line from the ball to the hole.

The consensus of opinion and the practise of experts undoubtedly points to a moderately open stance as being the most generally serviceable. Here again, as elsewhere, I strongly advise the continual examination of photographs of the best players. Imitation is probably the best way to learn any game so far as regards the actual playing of the stroke. Unless, however, one knows a

good deal of the reason for the positions that one is imitating one will lose a very great amount of time. The ideal way to learn golf is to get the analysis of the motions and the reasons from the book and then watch these being translated into action, not by one, but by dozens, of the leading players. This will be inconvenient for many people. The next best thing is to see all the photographs one can. One will not realize for some time how much benefit one is deriving from this method, but it is bound to make itself felt. Insensibly the outstanding points of importance impress themselves on one's mind and are finally incorporated in one's game.

This will not come to pass without intelligent effort and critical examination and comparison; but with these there is no doubt of the benefit to be obtained from photographs. Let me give an illustration. One of the commonest, and ugliest, faults of players is turning on the point of the left toe at the top of the swing and presenting the heel to the hole. If one has any idea of ever getting to know what rhythm means one must watch this left heel. After one has seen a dozen or two photographs and has compared the positions of the left heel at the top of the swing one will very thoroughly have learned the position in which it should be and probably much else of im-

portance about what the left foot is doing at this time.

The ball is generally addressed so that it is roughly speaking opposite the left eye. Some books give one the measurements in feet and inches. This cannot successfully be done. No two people "come at" a ball in the same way. This really is a case where one requires to let the pupil assert his "individuality," provided always that he does not immediately proceed to outrage Nature instead of trying to support the theory that she has especially interested herself in the production of golf strokes.

Another way of indicating the relative position of the player to the ball in the drive is by saying that if a line were drawn from the ball towards the player at a right angle to the line to the hole it would run six to eight inches behind the player's left heel. Even this must be taken as a general indication. There is nothing worse than getting it into one's mind that one must take up some particular attitude, for the truth about the golf stroke is far removed from that. It must be the most natural, unconstrained thing that my teaching and your thought and practise can produce or you will not get the enjoyment from it that you should.

It must be remembered that in this chapter on driving I am writing of the driver and the brassy,

JEROME D. TRAVERS

A Short Approach

Stance and Address with Mashie or Jigger

for, generally speaking, what applies to one applies equally to the other.

In addressing the ball one must endeavor so to regulate one's distance from it that one can hit it with a free easy swing without having to overreach, as this, of course, must tend to inaccuracy. On the other hand it is almost a worse fault to get too close to the ball, as this is quite fatal to good driving. It is only natural that it will take some little time for the beginner to find out his right position and, even when he is assisted by a professional, he need not expect to get it all at once. This is another case where sometimes the hard letter of the law must be relaxed to allow for personal idiosyncrasy. The main thing to be kept in mind, or rather to be assimilated, stowed away in the pigeon-holes of the mind and sub-consciously used, is that, so far as regards this particular matter, there is a lot of centrifugal force behind the head of a driver in the golf swing and that one should allow just so much as is necessary for the consequent swinging out of the club head. To correct this swinging out some golfers, without knowing why they do it, address the ball with the toe of the club. This is not to be recommended as a general practice. One should always address the ball, as nearly as possible, as one intends to return to it.

At the address the weight of the body should, as nearly as possible, be distributed equally between the legs. This again is one of those important things which nevertheless can be dismissed from one's mind almost as soon as one is told about it. It is so natural that having done it once or twice it will never occur to any one to do anything else. So, indeed, is it with the address. Nine of ten persons if given a driver and told to drive a ball would, so far as the relative position of feet and ball is concerned, take up a fairly good square stance. The alteration from this position to the open stance is very easy and is not unnatural.

The waggle.

If some journalist writing a book for a great golfer had made him say that Mother Nature had allotted to each golfer a special kind of waggle, and that herein lay the greatest display of individuality in any portion of this great game, I am afraid that I should not have been courageous enough to contradict him. I have no evidence to offer in rebuttal; and the fearful and wonderful and protracted efforts of some of the poor souls, whose main idea seems to be to put off the evil moment, would certainly be taken by many as strong corroborative testimony. To put it bru-

tally but graphically, the waggle is with far too many players and would-be players a compound of moral cowardice and ignorance.

I know this sounds unkind. One does not love the dentist or the surgeon while the forceps or the knife is doing its work—but afterwards, when the pang is over one can properly appreciate his efforts. Now, how is this defective waggling to be remedied.

It cannot be denied that the waggle is an important part of the golf stroke. Everybody does it, some more and some less, mostly more—especially when they are in front of us.

Now, if I were not dealing strictly with the science and practise of golf I might write a book on the "psychology" of the waggle, for unquestionably the waggle has a "psychology" of its own; yet I have heard of a man who went hunting the mystery of golf and never even saw the waggle, the most mysterious thing in golf. The waggle of most golfers has much in it whose reason and use are as recondite as the functions of the vermiform appendix, yet with this virgin field at their feet, or their agile pens, the golf scribes have passed heedlessly on.

To be perfectly serious, it is curious that this portion of the stroke has never received any real attention except in the solitary case in which I

illustrated George Duncan's waggle by diagrammatic photographs. Duncan's waggle is, however, the quickest in professional golf and, so far as my experience goes, in golf. There is nothing superfluous in it. He comes up to his ball as it lies on the fair green. As he approaches it he "sizes up" his shot. He settles easily and naturally to the ball, swings his club head up so that his forearms and the club are in one line pointing away to the hole, his upper arms hanging easily and naturally, and then allows the club head to sink quickly to rest behind the ball. Then he picks the club up so that the head rises up about fifteen inches and goes forward, in a gradual curve during the last six inches of its rise, until it momentarily stops about six inches forward of the ball; from here it sweeps backward and downward, nearly all the time in line with the hole, until after moving about three feet it comes to a stop for a fraction of a second at about a foot from the turf. From here it moves quickly, but smoothly, back to the ball, hesitates half an inch behind it and three inches from the turf, then sinks rapidly to the ground immediately behind the ball.

Although this takes a few words to describe it is over in a flash, yet it is performed without the semblance of a jerk. No more is necessary for a wag-

gle. Duncan has shown us that. To attempt to use less would probably be a mistake.

Now here again is an instance where we must be broad-minded, or human, enough to allow our player some little latitude. To insist on so short a waggle as this would ruin the stroke of many players, but I am prepared to use Duncan's extremely short and rapid waggle as a lesson to those who waste their own time, and that of countless players, in an effort to hypnotize the ball by weird and useless wavings of the club, about three quarters of which, instead of being any assistance, are a positive detriment and calculated to put one off making any kind of a decent shot.

The use of a waggle is to enable one to "loosen up" to the ball and to make the same motion, as nearly as one can in such a gentle way, as will be made in returning to the ball in the stroke. Thus it will be seen that all motions which take the club off the line to the hole and that line produced through the ball should, so far as possible, be avoided. If this be remembered and acted on, it will increase the capacity of our links wonderfully, for it will cut out an immense number of useless geometrical figures that are indulged in by those who stand in fear and trembling, making signs to the fetich of the waggle in the hope of propitiating

the divinity who presides over the mystery of golf, instead of cutting the mischievous little interloper off short, to the benefit of their game and the increased enjoyment of their fellow creatures.

In rifle shooting the first time you see the center is the time to let off. In golf, the first time you feel easy and right after settling down to your ball is the time to smite it. Procrastination in this connection is the thief of accuracy—and of your fellow-members' golf.

It would not matter so much if it were only your own time; but think of the string of unfortunate persons you are holding up behind you, merely for the purpose of confirming or increasing a bad habit. You will then probably decide to curtail your waggle by at least fifty per cent., which is about the average amount that could be cut off the waggle, not only without detriment but with positive benefit.

The left foot.

We have finished with the waggle and we are now back to the ball firmly and comfortably settled in the address. In the ordinary course I should now take you through the upward swing, but I have so much to say about the left foot that I must rivet your attention on it while the swing is being played. In the meantime you must not worry about what is

going on, and how it is being performed. You must give all the attention you can spare to the left foot, for believe me, it has been neglected and maligned and robbed in the past, and if you wish to make your game what it should be you must see that it gets justice.

The first thing that happens with the left foot in the upward swing is that the left heel leaves the ground. This does not in any way depend on the pull of the arms as is so often stated. It is not postponed until the club gets four or five feet from the ball. It starts when it is four or five inches from it, if not contemporaneously with its leaving the ball, if the stroke is played with true rhythm. The left heel continues to rise gradually and smoothly until it reaches the highest point from the earth at the top of the swing.

Now we have to consider how it rises. This may seem at first like an excess of analysis. It really is not so; and a proper understanding of it is the key, or one of the keys, to the most beautiful movement in golf, the proper loin and hip-work that is used by Harry Vardon, the finest stroke player in the world.

Quite ninety per cent. of players go wrong right here. Directly the heel rises from the ground, which quite frequently it does too late for true rhythm, they turn the foot in sideways so that the

pressure is all on one side of the sole of the foot—say, roughly, on a strip an inch wide and running from the ball of the big toe to the end of the toe. In order that there may be no mistake about this, James Braid in *How to Play Golf* gives a diagram of the sole of the shoe showing this strip.

This is bad golf. The pressure should be right across the front part of the foot in a line with the place where the toes join the foot; in fact, on the full breadth of the forward part of the foot. There should be no idea of "pivoting" on the left big toe. This word has been responsible for a vast amount of bad golf. It is thoroughly misleading. The left foot might be nailed through the toes across in a line with the ball of the big toe for all the "pivoting" it does in the golf stroke.

The left foot does undoubtedly assist the left knee in bending in *toward the ball.* Mark, *not* "toward the right leg," as one is usually told. This however we shall deal with later. The assistance given by the left foot in this respect is of a nature that has never been correctly set out by the great golfers. It comes mainly from a side bend of the ankle and a slight twisting of the foot at and about the instep. This movement should be most carefully studied, as on its proper performance rests the soundness of one's base at the top of the swing.

We have seen now that in the upward swing the left heel leaves the ground immediately the club leaves the ball. It continues to rise as the club goes up and at the same time the ankle joint turns inwards and the instep twists over a little. While this is taking place the left foot remains firmly planted on the ground with the weight that is on it, which will be considered in due course, distributed right across the foot, which does not in any sense of the word "pivot" or change from the position it was in relative to the line of flight of the ball. In fact, so that there may be no possible misunderstanding about it, I shall say plainly that the front third of the left foot is nailed to the earth for all the movement up, down or sideways that there is in it.

I have referred to the common error of pointing the left heel toward the hole at the top of the swing. This is a fault to which all those who indulge in "pivoting" are prone. The heel should rise and fall above its original position or practically so. It will be obvious that if the movement is properly made as indicated the heel will at the top of the swing be slightly farther away from the hole than in the address, but in no case must it be turned so that it goes nearer to the hole; in fact if the front part of the foot be kept firmly and properly placed the heel also must remain in its proper position.

In the downward swing the motions here described are reversed, and at the finish the left foot is firmly planted on the ground, as in the address, and the player finishes his drive slightly across the foot. This will receive due attention in its place.

The left leg.

The next portion of the body that we must consider is the left leg. Directly the left heel leaves the ground the left leg bends inwards at the knee in the direction of the ball. All books tell one that it bends in toward the right leg. This it never does, for a very simple yet all sufficient reason: it cannot bend that way! It was never intended to do so, and it will not. If any one doubts my statement let the experiment be made.

The truth is that the movement of the left knee is toward the ball. The knee only goes toward the right leg, when the stroke is properly played, so far as the bend of the left ankle joint and the turn of the left instep will allow it. If there is no attempt to overdo these natural actions one retains one's firm base right across the left foot at the toes and the "pad" of the foot, and has a solid foundation at the top of the swing, together with full command of the left leg, instead of a totally insecure foothold and such an unnatural position of the knee that all the weight is thrown onto the

right leg and the rhythm of the swing irretrievably ruined. We may now for a time leave the left leg and see what has been happening to its companion.

The right leg.

While all this has been happening, the right leg has not moved except torsionally. Here, I am afraid, I must allow some other portions of the anatomy to intrude on my sectional analysis, but I shall only do that in so far as I cannot keep them out, for I have a very definite object in considering each portion of the machinery by itself.

As the left knee moves in towards the ball it naturally pulls the left hip joint after it. The twisting movement of the body, commonly mis-called rotation, is supposed to take place with the spine as an axis. It follows then that this pulling forward of the left hip joint throws backward the right hip joint. As the right foot is planted firmly for its full length on the earth now and until some time after the top of the swing is reached, it follows that the right leg is twisted at the top of the swing.

It is this torsional strain that has been mistaken for weight and that has led to the great mistake made by the most famous professionals and writers in this most vital matter.

Now without considering the hands or arms we

have arrived at the top of the swing; and let me say now that although I have never even thought of teaching the drive this way in practise, it would probably be much sounder and productive of better results than the methods generally used.

The weight at the top of the swing.

We have now to consider a position of the very greatest importance in the golf swing. Certainly our player has arrived at it without arms or hands or a club. This in the ordinary way would no doubt be some slight handicap. It will, I think, make the task I have here if anything easier and my argument clearer, for our golfer is in effect a lump of material,—let us say, lead—supported on two legs of—say, iron.

Now we must see what the great players have to say about this question of the weight at the top of the swing, for it is not going too far to say that this is a matter that strikes at the very root of the game, that is actually a fundamental, that is a matter of principle, that admits of no paltering or equivocation. It is a question that has to be decided, on the evidence supplied to him, by every golfer who desires to know and to play real golf. Therefore it is a question worthy of close analysis.

So important do I consider this matter that it seems to me that if one teaches this incorrectly it

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does not matter what else one teaches correctly. False teaching here strikes at the very heart of the game.

Vardon, on page 68 of *The Complete Golfer*, says: "The movements of the feet and legs are important. In addressing the ball you stand with both feet flat and squarely placed on the ground, the weight equally divided between them, and the knees so slightly bent at the knee joints as to make the bending scarcely noticeable. This position is maintained during the upward movement of the club until the arms begin to pull at the body. The easiest and most natural thing to do then, and the one which suggests itself, is to raise the heel of the left foot and begin to pivot on the left toe, which allows the arms to proceed with their uplifting process without let or hindrance. Do not begin to pivot on this left toe ostentatiously or because you feel you ought to do so, but only when you know that the time has come, and you want to, and do it only to such an extent that the club can reach the full extent of the swing without any difficulty.

"While this is happening it follows that the weight of the body is being gradually thrown on to the right leg, which gradually stiffens, until at the top of the swing it is quite rigid, the left being at the same time in a state of comparative free-

dom, slightly bent in towards the right, with only just enough pressure on the toe to keep it in position."

This is Vardon's considered opinion on this important matter.

On page 53 of *Great Golfers,* he says, speaking of the Downward Swing: "In commencing the downward swing I try to feel that both hands and wrists are working together. The wrists start bringing the club down, and at the same moment, the left knee commences to resume its original position. The head during this time has been kept quite still, the body alone pivoting from the hips."

We must notice carefully that "The head during this time"—that is during the whole of the time from the address to the top of the swing—"has been quite still," and that the correct position at the finish of the backward or upward swing is obtained by "the body alone pivoting from the hips."

Analyzing these instructions we find:

1. That at the address the weight is equally divided between the feet.

2. That during the swing the head must be kept quite still.

3. That the pivoting of the body must be done at the hips.

4. That there is no change in the position of the right foot.

Therefore, we start with the weight equally distributed between the feet. We are held as in a vise so far as backward movement, or movement away from the hole, is concerned, at three points, the right foot, the right hip and the head; yet at the top of the swing all the weight of the body has in some mysterious manner got onto the right leg!

James Braid makes the same statement about the weight at the top of the swing. On page 56 of *Advanced Golf* he says: "At the top of the swing, although nearly all the weight will be on the right foot, the player must feel a distinct pressure on the left one, that is to say, it must still be doing a small share in the work of supporting the body."

We have J. H. Taylor also as a subscriber to this idea. On page 207 of *Taylor on Golf* he says: "Then as the club comes back in the swing, the weight should be shifted by degrees, quietly and gradually, until when the club has reached its topmost point the whole weight of the body is supported by the right leg, the left foot at this time being turned, and the left knee bent in towards the right leg. Next, as the club is taken back to the horizontal position behind the head, the shoulders should be swung around, although the head must

be allowed to remain in the same position with the eyes looking over the left shoulder."

Mr. Walter J. Travis in *Practical Golf* says: "In the upward swing it will be noticed that the body has been turned very freely with the natural transference of weight almost entirely to the right foot, and that the left foot has been pulled up and around on the toe. Without such aid the downward stroke would be lacking in pith."

Mr. Travis makes it very clear that his idea of the drive in golf is that one must get on to one's right leg at the top of one's swing if one wants to get "pith" in one's drive.

Mr. Horace Hutchinson on page 88 of *Golf* in the Badminton Series says: "Now, as the club came to the horizontal behind the head, the body will have been allowed to turn, gently, with its weight upon the right foot."

Surely this is a mass of authority in favor of the right foot. I am presenting it all here because I know that I must face it. I am diametrically opposed to this teaching; and when you have read what I have said, and have tested it, you must elect whether you intend to remain true to the fetiches of tradition or to become a disciple of The New Golf.

There is no possible doubt of the rooted nature of this false idea. The greatest writers and play-

ers emphasize it over and over again. James Braid is particularly emphatic about it. In *How to Play Golf* he says: "When the swing is well started, that is to say, when the club has been taken a matter of about a couple of feet from the ball, it will become impossible, or at least inconvenient and uncomfortable to keep the feet so firmly planted on the ground as they were when the address was made. It is the left one that wants to move, and consequently at this stage you must allow it to pivot. By this is meant that the heel is raised slightly, and the foot turns over until only the ball of it rests on the ground. Many players pivot on the toe, but I think this is not so safe, and does not preserve the balance so well. When this pivoting begins, the weight is being taken off the left leg and transferred almost entirely to the right, and at the same moment the left knee turns in towards the right toe. The right leg then stiffens a little and the right heel is more firmly than ever planted on the ground."

This matter is vital to the playing of the swing. I am charging plainly that all the current teaching about it is false and misleading and calculated to injure, instead of to improve, one's game; therefore I must be most specific and analytical in condemning fundamental teaching so strongly reenforced as this is.

I may say, however, that it seems to me that the famous golfers and writers, for I have not quoted the half of those who preach this doctrine, have a fairly stiff mechanical problem to deal with in the exposition I have already given. I shall however try to make it a little stronger.

Even those with a very slight knowledge of golf are aware that swaying is a bad fault. Swaying means drawing the body away from the hole in making the stroke. Vardon is most emphatic about this. He says: "In the upward movement of the club the body must pivot from the waist alone and there must be no swaying, not even to the extent of an inch."

We are all familiar with the instructions given by nearly every man who has put his name to a golf book, namely, to make the spine the "axis" of the twisting movement. One writer (I am almost sure that it is J. H. Taylor) explains that the twisting takes place on an imaginary axis consisting of a rod of iron coinciding with the spine and continuing until it buries itself in the ground. We thus get a very vivid idea of the importance attached to there being no movement away from the hole during the swing, but if we start with our weight equally distributed and twist round on our iron spine how can we possibly get all, or indeed any

more of it than was originally there, on to the right foot? I must leave some one else to answer this question. As a matter of fact it cannot be done. The instructions given are quite faulty. It might —I say it *might*—be good golf to have all one's weight on the right foot at the top of the swing, but there is nothing more certain on earth than that it cannot be put there *by the means described in nearly every book on golf.*

We have settled fairly conclusively that the weight at the top of the swing cannot go on to the right leg. We must now inquire where it does go. The answer to this is simple, natural and practical as everything in good golf should be. For all practical purposes we may say that the weight at the top of the swing is equally divided between the legs. That is the best, the simplest, and the most natural idea for the golfer to get into his mind. He must at the top of his swing keep himself so that his weight remains distributed as it was at the address.

This is the idea, the practical idea, that entails no thought, no special attention, after one has properly absorbed it, yet it will carry one farther than the equal distribution of weight, as it should do. It will in fact put slightly more weight on the left foot than on the right, but the player will not

have to cumber his mind with this operation. It comes about naturally of itself when once the fundamentals have sunk into one's mind.

My readers must remember that we have arrived at the top of the swing, my lay figure merely a leaden body with two iron legs, placed as in the address at golf. All told the figure weighs say one hundred pounds. The legs are resting on two separate scales each of which shows a weight of fifty pounds. Let us now take a hammer and knock in the left "knee" so that it bends in toward the ball, and then see what has happened. Naturally the figure has tilted over a little to the left, that is toward the hole. Naturally also there is now more weight on the left "leg" for the shortening of the prop under the weight by bending it has brought more of the weight forward, and the left leg is shortened by being bent, despite the fact of the left heel being raised.

From all of which it will be seen that in a well-executed drive at golf, instead of drawing weight away from the hole at the top of the swing, the player either keeps it as it was, or advances it slightly toward the hole. It must be remembered, however, that advancing one's weight towards the hole does not necessarily mean moving one's body forward. One's head may have been kept perfectly still and yet heavier portions of the body

may have been twisted just over the dividing line.

At the top of the swing the left foot should undoubtedly carry a little more of the weight than the right. This was proved at the historic demonstration that I gave to the Golfers and the Press of the World at the West End School of Golf, Piccadilly, London.

I had made to my order two scales, each weighing up to two hundred pounds. These were placed close together. The golfer took his stance with his weight equally divided. A lever which operated a pointer on a measure graduated to quarter inches was put within a fraction of an inch of his hip. One also curved in and came up close to his neck so that it did not interfere with his drive. We now had him with his weight equally distributed and he had to play his stroke so that it all got on to his right leg without disturbing either of the levers. I offered Braid, Taylor and Vardon two hundred and fifty dollars each if they could prove their theories to be practical golf. By this time, however, they had come to see the mistaken idea in the prevalent teaching.

James Sherlock and other famous golfers tried the machine. I offered Sherlock a hundred and twenty-five dollars on the spot if he could do what we are combating as false teaching. He got on the machine and tried in every possible way to get

that money. Finally he got down and, "It's no use; it can't be done." To which I replied, "You may be fairly sure I knew that before I offered you a hundred and twenty-five dollars."

This machine is regarded as such a valuable means of instruction that the West End School of Golf would not sell it to a friend of mine who wanted one for New York so he had to get a duplicate made. If there is any lingering doubt in any one's mind now as to whether the teaching of the new golf is sound or not in this vital point I shall be glad to arrange for a demonstration in New York similar to that given in London.

In *Great Golfers,* speaking of his stance and address, Vardon says: "I stand firmly with the weight rather on the right leg." Later on speaking of the top of the swing he says: "There is distinct pressure of the left toe and very little more weight should be felt on the right leg than there was when the ball was addressed."

Unfortunately this was published long before the statements of Vardon which I have already quoted. Personally I believe that if it were put up to him to-day he would abide by the last quoted statement, but we cannot of course decide that. We merely have to take his written word as we find it and deal with that.

We have now got to the top of our swing, minus

our head and our arms. So far we have been able to do very well without them for they would only have been in our way. We have been considering things that were nearer to the foundation of the swing—things which literally are the foundation. Take, for instance, this question of resting squarely across the full width of the left foot. I have brought you now to see that more weight should be on the left foot than there is on the right at the top of the swing. Does it not then follow that you must have a firm and solid base for the foot which takes such an important part in the drive?

Never in the bibliography of golf has the importance of this point been adequately impressed on golfers and learners. I had written *Modern Golf* and *The Soul of Golf* before I came to realize that it is primarily from this that Harry Vardon gets his rhythm.

The arms in the upward swing.

There is no mystery about what the arms and wrists do in the upward swing. I have spoken of the press forward. This is not an essential, but I do believe that it is useful. The hands are advanced so that they go forward of the ball a few inches just before the club is raised from the ground. It does, I think, tend to stop the hands

getting away before the club head; moreover it feels comfortable. The next thing is to pick your club up naturally, holding it tightly with both hands, and to hit the ball, still holding it tightly with both hands.

Of course there is a good deal that goes on in the meantime, but one of the greatest secrets of successful driving is to avoid monkeying round with your grip while you are making the stroke. The grip with which you left the ball is the grip with which you want to return to it. There must be no thought of any modification of it, any loosening up here or tightening there, giving the forefinger a holiday here and the thumb there. Cut out all that nonsense, for your grip is your grip, and, once having taken it, you must abide by it.

There is another advantage in holding firmly to the shaft when once one has got the right grip. It does not give one so much chance to use the wrist wrongly, which is an outstanding fault with beginners, especially those who change their grip as the club is going up or coming down. Moreover it tends to prevent over swinging which comes so naturally to those who loosen up and lose control of the club at that most critical point, the top of the swing.

Having taken a firm hold of the club with both hands, swing it easily and naturally back until it

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reaches a horizontal position behind your head and within a few inches of your neck. When you get up to this position you will still have a firm hold of the club, it will be pointing towards the hole, the shaft being nearly parallel to the line from the ball to the hole and the toe of it will be hanging down towards the earth and slightly nearer the line of flight than the heel.

Now, in bringing the club up to this position you have used a good deal of what is called wrist action, only it is not wrist action. You have turned your forearms. Some people call it the roll of the forearm. Those who want you to think they know a lot about anatomy talk of pronation and supination. The roll of the forearm will do for us.

If you have allowed your forearms to roll naturally, you will find when you get to the top of the swing that your wrists are underneath the shaft of the club, and in such a position that if your club were an ax, you could strike a good hefty blow at a block of wood in a line with your right shoulder and about four feet away from it. This is a good test of the position of the wrists. Remember, that although you want to strike the ball in front of you, you develop your power precisely as though you were hitting that block of wood. You must not try to get to the ball by a quicker route than

the natural track of the club head which is very nearly a circle. Do not cramp either of the arms, particularly the right. Hugging the ribs with the right elbow was once a fetich. Avoid it. Nobody ever saw Vardon do it, and his style is as good as any to go by, particularly as his swing is of the upright variety and therefore the safest and best for golf, as the club head remains much longer in the line of flight than in the flatter swing of some players. I have never been able to see any advantage in a flat swing. I have never seen any advantage claimed for it by any one entitled to speak with authority; and those famous professionals who use it do not advocate it in preference to the upright swing, which I feel sure is most suited to the great majority of players and in the long run the best for the game.

It is usual to instruct the beginners to carry the club back straight from the ball, as far as one can conveniently, until one's arms pull it off the line. It is doubtful if there is any advantage in this. Probably one would get just as good results by letting the head of the club take care of itself and forgetting all about this. It is a certainty that on the return journey the club does not follow this path, and, personally, I am inclined to think that this part of the stroke may well be forgotten. As a matter of fact the more one sees of golf the more

one realizes what an astounding number of things there are that one can with much profit, directly one addresses one's ball—forget.

It is customary to attempt to tell one where this alleged "wrist action," this roll of the forearms—comes in. Any one who strives to put it in at any particular point either going up or coming down may just as well give up golf and look for some other game. It is a perfectly natural movement distributed over practically the whole "journey" of the forearms. It cannot be assigned to any particular place. If one grips one's club properly, and maintains one's grip, it will have to come in in its right place. This is another action which is so perfectly natural that it may soon be left to take care of itself.

The downward swing.

I purposely brought my readers up to the top of the swing by sections. Going down I may not retain that plan in its entirety. It is not so necessary. I am of opinion that arriving at the correct position at the top of the swing is of the utmost importance. I think that if a player achieves that he has an excellent chance for the rest of the stroke.

I am frequently asked how the downward swing is started. I am making in this book a statement about it that is, so far as my knowledge of golf

and golf writing goes, new, but I believe that it is sound. The downward swing in a drive of perfect rhythm is, I believe, started by the player's body *before the upward swing is completed by the club* having dropped to its lowest point. The player's body is starting to "unwind," to use the term so often employed by writers, before the upward swing of the club is finished. I am inclined to think that this is to a great extent the reason that there is less apparent conflict of motion, less jerkiness than one might expect, at this point. I have mentioned this idea to one player of great experience and ability and he agrees with me that it is as I say. Personally I should like to experiment and investigate a little more before pronouncing authoritatively on this interesting point. I may say, however, that the motion pictures of the famous players seem to lend color to my idea. In many cases they show a considerable breadth of the back before the club has got to the lowest point and by the time the club has reached the lowest point they are showing much less of the back. This, it seems to me, upholds my idea.

Whether this is so or not there is, I think, no doubt that the body starts the downward swing. I have read a good deal about the "hands leading." I should have to reorganize all my ideas, not only of golf, but of almost every other sport, if

this were correct. It is the body that starts nearly every analogous movement in athletics, and the drive in golf is not a law unto itself.

Now again I am going to throw my readers to a great extent on their own resources. I am not going to make any attempt to tell them how to "divide up" the downward stroke so far as regards the arm action. If the ball were a daisy one would not want such instruction. Why should one require it because what one is aiming at happens to be a golf ball. The stroke is a most perfectly natural reversal of the upward movement with the roll of the fore-arms again distributed. It is quite futile to attempt to tell any one "where the wrists come in," because nobody can do it. Even James Braid has confessed that he does not know.

Harry Vardon is not a believer in the idea of wrist action. At page 70 of *The Complete Golfer* he says: "Now pay attention to the wrists. They should be held fairly tightly. If the club is held tightly the wrists will be tight, and vice versa. When the wrists are tight there is little play in them and more is demanded of the arms. I do not believe in the long ball coming from the wrists. In defiance of principles which are accepted in many quarters, I will go so far as to say that, except in putting, there is no pure wrist shot in golf. Some players attempt to play their short

approach with their wrists as they have been told to do. These men are likely to remain at long handicaps for a long time. Similarly there is a kind of a superstition that the elect among drivers get in some peculiar kind of 'snap'—a momentary forward pushing movement—with their wrists at the time of impact, and that it is this wrist work at the critical period which gives the grand length to their drives, those extra twenty or thirty yards which make the stroke look so splendid, so uncommon, and which make the next shot so much easier. Generally speaking, the wrists, when held firmly, will take very good care of themselves."

I am glad to be able to quote Vardon in demolishing the absurd idea of the long driver getting his power from his wrists. Whenever any one speaks like that it nearly always means, if one only knew it, from the forearms. Trying to put one's wrists into the downward stroke is fatal to accuracy for any one who tries to do it at the wrong time. Any particular thing of value that the wrists do they do at the beginning of the downward swing. Except as a connecting joint they have gone out of business long before the ball is reached.

Braid says: "Where exactly the wrists begin to do their proper work I have never been able to

determine exactly, for the work is almost instantaneously brief!" Well, if Braid does as well as he does without knowing anything about where the wrists come in, the ordinary golfer may take heart of grace and reflect that it cannot be absolutely necessary for one to know. As a matter of practical golf one will do well to forget that one has wrists, except, perhaps, on the green.

In *Advanced Golf,* James Braid on page 61 and in the preceding pages explains that the whole idea of the golf stroke is supreme tension, and that at the moment of impact the tension is greatest. He says: "Then comes the moment of impact. Crack! Everything is let loose, and round comes the body immediately the ball is struck and goes slightly forward until the player is facing the line of flight."

I want my readers particularly to gather the idea of "tension" of "supreme tension." Braid condemns the idea of the "even acceleration of speed" that we hear so much about. His advice is so valuable that I must quote it: "What he (the player) has to concern himself with is not getting his speed gradually, but getting as much of it as he possibly can right from the top. No gentle starting, but hard at it from the very top, and the harder you start the greater will be the momentum of the club when the ball is reached."

"Hard at it from the very top" is good advice in driving. As Vardon tells us, if we grip tightly we put the wrists out of business. Well, we don't require to think of them in any way. Anything that they do, and of course they are important, is so natural, so much an integral portion of the arm movement that it is practically removed from the player's field of inquiry.

The right leg and hip-action.

So far the right leg has not had much attention. We left it at the top of the swing, firmly planted on the right foot, which had not moved in the upward swing, and full of that torsional strain, which, as we have already seen, is so often mistaken for weight; which, in fact, in my opinion, is responsible for all the false teaching about the distribution of weight at the top of the swing.

Now, however, it has to get a little more action. Almost directly the club starts on the return journey to the ball the right heel begins to leave the ground. As it comes up, it performs a most peculiar function in the swing of some of the most famous players. It pushes the hips forward towards the hole. This is easily the most elusive action, and I think the hardest to describe, in golf. In Vardon's case the downward stroke is scarcely more than a fourth of the way through before this

peculiar pushing forward of the hips takes place. Naturally this movement brings the left foot down firmly on the turf, but the left leg does not straighten immediately. It remains slightly bent, while at the same time the right heel continues to rise so as to enable the body to follow through, which it does easily and naturally, nearly all the weight going on to the left foot at the finish. That is the way Vardon plays the stroke, but it is not the way in which many of the best players in the United States of America do it. They have a habit of cutting off the transference of weight, and very few of them have the hip action I speak of.

Now, this hip action has never been properly explained. Vardon, so far as I am aware, has never said what he thinks of it in his own case, or why he does it. I do not wish to dogmatize about this hip action, but I believe that it comes in earlier in the swing than I have indicated. I am inclined to think that this forward push of the hips sets up the reciprocating movement of the shoulders and so throws them back into position so that Vardon can come in under his head as he does; in other words, so that he can get his back into it in his own inimitable manner, which is so closely, yet not exactly, followed by his faithful disciple and admirer, George Duncan.

I do not care to speak positively about this char-

acteristic of Vardon's drive. The action is found in nearly every upright drive of good rhythm, so it would be useless to overlook it in an analysis of the golf stroke. Something, I think, it must add to the speed and also the accuracy of the stroke. It keeps the club more in line with the hole. It makes the player hit more under his body; in other words, get his back muscles into the stroke and it seems as though it gives more scope for the right hand "punch." In Vardon's case I think that it gives his right arm, which he carries fairly wide of his body, every opportunity to get all the speed possible out of it by coming through with the blow delivered for a long distance in the line to the hole.

The main speed of the golf stroke comes out of the elbow joint and the turn of the forearm. The greatest factor probably, almost certainly, is the unflexing of the right elbow-joint. It seems to me that if the golf swing can be so played as to have this take place mainly in the line to the hole it is an advantage.

It must not be thought that this hip action is necessary. It would be useless for many to attempt it. The downward stroke may quite well be played by forgetting about the hips, except in so far as they come in naturally, and letting the right heel come up easily and gradually in the downward

swing while the left is sinking back to its original position and straightening the left leg again.

The impact.

This is the momentous part of the stroke. What happens during the fraction of an inch that the club and ball travel together in adhesion means as much to the golf ball as the direction of the barrel at the time of the explosion of the cartridge does to the rifle bullet.

It will be interesting to see what Vardon says of this position: "When the ball has been struck, and the follow-through is being accomplished, there are two rules, hitherto held sacred, which may at last be broken. With the direction and force of the swing your chest is naturally turned round until it is facing the flag, and your body now abandons all restraint, and to a certain extent throws itself, as it were, after the ball. There is a great art in timing this body movement exactly. If it takes place the fiftieth part of a second too soon the stroke will be entirely ruined; if it comes too late it will be quite ineffectual and will only result in making the golfer feel uneasy, and as if something had gone wrong. When made at the proper instant it adds a good piece of distance to the drive, and that instant, as explained, is just when the club is following through."

There is a statement in this quotation that I must refer to in passing. Vardon says that in the follow-through "your body now abandons all restraint." James Braid also encourages this idea. I think that it is both a bad idea and impractical golf. If one has come down at the ball at full tension it will be impossible immediately after one has hit it to abandon all restraint, nor indeed is it advisable to do so, as witness the fine firm finish and beautiful poise with which Vardon completes his drive. One must not have it in one's mind that the tension and concentration go only half way through the swing. I am afraid that that would not be conducive to good golf. That, however, is by the way.

The important point for us to consider at and about the impact is the transference of the weight. According to all the best theory it is, or should be, moving from the right leg to the left leg. Instantaneous pictures of Vardon do not show this to be the case. They show unmistakably that at the top of his swing more of his weight is on his left leg than on his right. In a man of his weight there would be from eight to twelve pounds more on the left foot than on the right. Then we see that he moves his hips forward suddenly. This sudden pushing forward of the hips sets up the reciprocating motion of the shoulders that I have referred

JEROME D. TRAVERS

Top of Swing with Mashie or Jigger

Stance and Address with Cleek or Driving Iron

to and probably throws back to the right leg a certain amount of weight which comes into the stroke at the moment of impact. This however is not a certainty. There is a chance here for some one to fit my machine with a double recording needle that will catch and record the weight on the right leg at the top of the swing and also record the highest weight thereafter put on the right leg during the swing. Before one could speak authoritatively on this point I believe that this would have to be done. The scales were made by the most famous scales makers in England, but they could not arrange this mechanism for me in time for our demonstration, nor for the purposes of that demonstration was it absolutely necessary.

The chief point to notice in Vardon's statement about the management of the body weight is contained in the following words. He says that it must be timed to the minutest fraction of a second "just when the club is following through."

Now there can be no doubt that timing this body movement does require a great deal of skill; so much indeed that a great many players make no conscious effort whatever to get it, and finish their stroke with their heads over the ball and the arms going away on their own account, which cannot be considered the best form. It is however equally certain that Vardon makes a great error

when he says that the time to put this body weight into the stroke "is just when the club is following through."

From the first instant that the club starts "following through" it has absolutely lost any power to influence the flight of the ball. The stroke has been played and nothing that the player can do with his body or any other portion of his anatomy can affect the flight of the ball in the least degree. The moment one must choose for endeavoring to put this body weight into the blow must be the time during which the club is making the last two or three inches before it hits the ball and then the effort must not be made at that time. It must be a portion of the swing naturally and harmoniously welded into it to come in at this instant. Any other way of trying to get it must fail and will ruin the rhythm of the swing. The main point however is that in any attempt to get this extremely accurate piece of timing the idea in one's mind must be to do it before impact, and *not*, as Vardon explicitly states, "just when the club is following through"; for then it will be waste effort.

The head.

I have not had much to say about the head. The fact is that there is not much to say about the head

that cannot better be said when dealing with the function of the eyes. The paramount duty of the head is to keep still, to keep in the place it was in at the moment of address both as regards distance from the hole and height from the ground until the ball has been struck. Then, and then only, is it released and allowed to become a portion of the movable machinery of the drive, and there are not wanting those who wish to deny it this privilege. However we shall have an opportunity of dealing fully with this aspect of the case when we come to consider in a future chapter what the eyes have to do.

Summing up.

I have given all the main features of the drive in sections, and in a way not hitherto done. It must be learned thoroughly in sections unless one is lucky enough to be able to get it thoroughly from some first-class player by imitating him. Golf however is such a scientific game that if one trusts to blind copying there is a great chance that the path to improvement will be long and arduous. One should try to get all the details of the various movements and instructions herein set out stored away in one's mind so that there is no conscious effort to produce them when one is face to face with the ball. This is much easier than it might

seem for there is herein nothing that is unnatural. That is the great point. The New Golf means following nature and the simple truth, and not running after mystery and unnatural methods.

Let us sum up the work in the drive now as shortly as possible. From the address the club is picked up, after the press forward. At the same instant the left heel begins to rise. The club is taken back on the upward swing, the left heel continuing to rise and the left knee bending in toward the ball on account of the bending of the ankle and the twist of the instep, but the front part of the left foot remains firmly planted on the earth so that the weight is spread across it.

As the left hip follows the left knee forward the right hip is drawn back, the spine remaining in practically the same position all the time. The right foot remains solidly and firmly planted on the ground from heel to toe until at the top of the swing the torsional strain caused by the half twist of the body at the hips can be very distinctly felt, in fact so distinctly that the leg becomes quite rigid and the knee joint is absolutely stiff. It is not bent in the slightest degree, as were both knees at the moment of address. At the top of the swing the wrists must be well under the shaft of the club. The downward swing is started by the body and the hands and arms follow, reversing the motion

of the upward swing. Soon after the beginning of the downward swing the right heel begins to leave the ground the hips are pushed slightly forward towards the hole and the left heel begins to return to the earth until at the moment of impact it has settled firmly into its place again, whereas the right heel is up a little and the right knee bent as the body goes forward for the finish of the stroke which is generally a little across the left foot. If it is not so it is usually an indication that the player's stance was at first too open or that he has twisted on his left foot during the downward swing, which is to be avoided.

I have possibly omitted some slight detail in connection with the drive which seemed to me so obvious as not to need any special mention. If there is anything of this nature that is not found in the letter press a careful study of the photographs will no doubt repair the deficiency.

CHAPTER IX

THE NIBLICK

A famous Frenchman was once talking to me about golf. He is a great swordsman and occupies an important position in one of the greatest firms in France. The nature of his work brings him constantly face to face with many mechanical problems. He had attacked golf just as he would have undertaken any one of his business difficulties. I was astonished to find how much he had learned in his short acquaintance with the game. He knew more about the fundamental principles of it than most men who had played for more years than he had weeks.

I was much amused at one of his remarks, which has in it a great lesson for lazy learners. "The bunker," he said, in answer to my question as to his proficiency with the niblick, "does not annoy me any more. I knew that I should have to spend a good deal of my time there, so I took it all at once. I stayed in one of them, the worst I could find, for a day. Now we are good friends."

I feel that I need not point the moral.

The first thing one should do about being bunkered is to learn not to be angry about it. It really is not so difficult to do this as many people think. Many bunker shots are extremely beautiful and interesting, and if one were playing them merely as practise or in demonstrating the shot to a friend one would be quite pleased, if not indeed proud, to make them. It surely, therefore, needs no argument by me to convince any one that to approach the bunker as a friend, who will give one a chance to show one's control and skill, is much better than coming up to it feeling that it is a thief who is trying to steal something from one. Unless one can feel like this about the bunker one should live in one occasionally, not necessarily however for a day at a time.

I am satisfied that this matter is one of those that had better be left to the player. There is no place like the bunker for instruction as to how to get out of it. There are however some quite important matters that I may refer to shortly.

The most important thing when one is in a bunker—is to get out. No, I am not looking for a laugh here. Quite a number of people do not realize this. Many, even quite good golfers, refuse to accept this idea as practical golf and insist on "having a lash" to get distance when

obviously the right thing to have done was to have played to get out and into position for the next stroke.

It is of course sometimes possible to play for distance if the ball happens to be lying well, but this is exceptional. Generally one has to make getting out, sometimes with a bit of distance included, sometimes merely getting out and into position, the first consideration.

A persistent delusion about bunker shots is that one must smite the sand and not the ball. This has been carried to such an extent that people now punch the sand unnecessarily far behind the ball. In very many cases the ball can be played by not taking the sand more than an inch or so from the ball. This varies of course with the state of the weather and the character of the sand, clay, gravel or other material on which the ball is lying. It is always well to aim behind the ball, quite apart from any other consideration, for, as one is not allowed to ground one's club in a bunker, there is always a slight tendency not to get right down to the stroke.

Many of the best bunker shots are played by a cut shot, the niblick being swung across from right to left. This cut gives a very quick rise.

In many cases one has to trust to a downright punch into the sand in which the ball is knocked

out of the bunker by the concussion of the blow and not by contact with the club.

If ever there was a case which should teach the golfer to trust the loft of his club this is it. The greatest secret in getting up and out of a bunker is knowing how to hit down hard enough. One simply has to put all one's strength into the sand, thrash at it with wrists and arms like steel as if one intended to go on for a foot or two into it. There must be no idea of turning the face of the club up as we are sometimes told. Leave the loft to attend to itself and give the sand or other stuff the hardest punch you know how and don't do anything to stop that punch. Let the bunker absorb the follow-through. Unless you do this the stroke is not likely to be a success.

The variety of bunker shots is, however, so great that each one probably presents some point in stance, grip, swing or something else that can only be properly explained at the time in the bunker. Therefore, get thee to a bunker, preferably with a wise friend, but if such a one is not available, still, get thee to a bunker, with a trusty niblick and try the prescription of our French friend.

If one is lucky enough to have a lie which gives a fairly good chance of getting any distance, when distance is desired, one must remember that there

is always a better chance of clearing the hazard if one plays the shot with some cut or slice. This must, however, depend in every case on the nature and position of the lie and the direction desired.

In playing any of these cut shots in a bunker, with any kind of a club, there must be no attempt whatever to do what one is so often told to do, namely, to draw the club in towards one at the moment of impact. Even when one is hitting the ball cleanly—and this is occasionally done in bunkers, although to read most books and articles one would think otherwise—it is fatal to attempt to pull the club across the ball at the moment of impact. I need hardly say what it would be if the same attempt were made with an ounce or two of sand between the ball and the club.

CHAPTER X

THE MASTER STROKE

WHEN Harry Vardon published *The Complete Golfer,* he said that in his opinion the master stroke of the game was: ". . . the ball struck by any club to which a big pull or slice is intentionally applied for the accomplishment of a specific purpose which could not be achieved in any other way."

What he says about it is interesting enough to quote fully. At page 86 of *The Complete Golfer* he says: "What, then, is the master stroke? I say that it is the ball struck by any club to which a big pull or slice is intentionally applied for the accomplishment of a specific purpose which could not be achieved in any other way; and nothing more exemplifies the curious waywardness of this game of ours than the fact that the stroke which is the confounding and torture of the beginner who does it constantly, he knows not why, but always to his detriment, should later on at times be the most coveted shot of all and should then be the most difficult of accomplishment. I call it the

master shot, because to acomplish it with any certainty and perfection is so difficult, even to the experienced golfer, because it calls for the most absolute command over the club and every nerve and sinew of the body, and the courageous heart of the true sportsman whom no difficulty may daunt, and because, when properly done, it is a splendid thing to see, and for a certainty results in material gain to the man who played it."

It would be hard indeed to find a more outspoken or enthusiastic declaration in favor of the pull and the slice as the master strokes in golf.

J. H. Taylor is not at all enthusiastic about these strokes. He says at page 88 of *Taylor on Golf:* "Still it is not advisable, neither do I look upon it as being golf in the truest sense of the word, for the knack of pulling or slicing to be cultivated, as I am afraid it is by a great many players. No compromise should be made with a fault."

As I write this my mind runs back to a glorious summer afternoon at Mid Surrey, Taylor's famous home course. Coming to one of the greens Taylor got off the line a bit and for his approach found his way to the green blocked by a great tree. I had taken a friend down to see the match, but I forget who Taylor's opponent was.

"Watch him cut round the tree," I said. "He can just about swerve to the edge of the green and

JEROME D. TRAVERS

Top of Swing in Iron Play

Note carefully the upright swing, which is of great importance in nearly all iron play

Finish of a Mashie Approach

Observe the upright finish which makes for good direction in iron play generally

then his cut will carry him in near the pin." I knew what Taylor could do with his mashie. He did it.

He played a beautiful cut shot that swept past the tree, curled a little in its flight, dropped on the edge of the very large green, then took its side roll and ran in nearly to the hole. It was a perfect approach, yet without the slice—for cut (except back-cut) in golf is merely slice by another name and with a different club, and what one wants to do with a mashie to-day he may want to do with a brassy to-morrow—it would have been impossible.

It is however interesting to have the different views of such famous players. It is indeed true that if one plays golf as one should play it one will not often require to slice or pull, for such strokes are generally in the nature of atonement, or attempted atonement, for some previous error; but then who, among us, does play golf as one should play it. Therefore it seems that we must continue to recognize the existence of the pull and the slice but we must also try to relegate them to their proper places in the game.

In 1909 I said that if I had to name a stroke in golf as the master stroke, other than the simple put, I should name the "wind cheater," or the class of strokes that now come in under the mis-

nomer of "push." I am, and have been for years, of opinion that the most valuable spin in golf is backspin. For one most important reason I put strokes of this class ahead of the pull and the slice. They are infinitely more reliable. The spin does not affect their direction. It merely affects the trajectory, and on that it has a very beneficial effect.

In Harry Vardon's latest book *How to Play Golf* he comes round entirely to my point of view and declares outright and without any qualification that in his opinion the push stroke is the master stroke in golf. He also explains how it is played, or rather, perhaps I should say, how he thinks it is played. I put it this way, for I think that his explanation of the stroke is one of the most marvelous mistakes that has ever been associated with the name of a famous player.

Vardon says that the stroke is played by coming down on the ball with the face of the club overhanging it and then, just at the moment of impact, twisting the club vigorously round the ball so as to produce the necessary amount of backspin.

The proper method of playing this beautiful and useful stroke provided one of the most remarkable controversies in the history of English golf. Some of the explanations that were given were simply amazing, while some were also extremely amusing.

The fact that Vardon now considers this stroke the master stroke in golf warrants our giving it the closest analysis and attention. Whatever one thinks of Vardon's explanation one can have nothing but admiration for his execution of this beautiful stroke.

He will place a ball on the turf and show you the spot in front of the ball where he will cut the turf after he has sent the ball on its way, and he will do this with mathematical accuracy, but he does this by nature and not by his published theory of the stroke, which is not practical golf, which is in fact impossible of accomplishment by any one—even a Vardon.

I may explain in the first place how Vardon plays the shot in so far as regards those portions of it that are not the subject of controversy. According to one of his regular chroniclers he uses a cleek that is somewhat shorter than his ordinary club and with a more upright lie and greater loft. It is also somewhat deeper in the face. The upright lie naturally brings him in more over the ball. He addresses the ball so that his hands are several inches in front of it. At the top of the swing his weight is well forward. Then he comes down on the ball and hits it very hard so that it bounces off the ground!

I am not responsible for any of this description,

but it is practically correct until we come to the last statement—which we may kindly forget.

The storm of controversy centered about what happened at the moment of impact. I must try to explain that as simply and shortly as possible and then show the result of the stroke.

The master stroke in golf, which is called the "push," when played with a cleek, and a "wind cheater," or something else, when played with a wooden club, although it is essentially the same stroke, is simply a descending blow. The ball is struck by the club before it has reached the lowest point in its swing. That really covers the whole ground, and had it not been for the wonderful statements that have been made about the stroke it would hardly be necessary to amplify it.

Although the stroke is a descending blow the club must reach the ball in such a manner that the loft can act on the ball by hitting it beneath the center of its mass and with the face of the club inclined backward. It is obvious that unless this were done the ball would not rise.

The loft of the club is lessened by the fact that one addresses the ball with the hands forward of the club by about two or three inches. The object of this is to regulate the swing of the club so that it reaches its lowest point about where one usually addresses the ball. This means that it

passes across the back of the ball on its way down to the lowest point in the swing and cuts or should cut or graze the turf an inch or so in front of where the ball lay before it was struck. The finish of the stroke is low and the head of the club should follow out down the line to the hole as much as possible. The stroke is in fact a chop. It is if possible more of a hit than other iron strokes. A player might get a better idea of it if he were told to "rap" it. I heard that somewhere once, and the underlying idea seemed good to me. There probably is no stroke in golf where one seems to finish on the ball more. This is no doubt on account of the force which goes into the downward hit. One must hit this ball for all one is worth and leave the earth or anything else that comes in the way to absorb all the shock that is not taken up by the ball.

The flight of this ball and the run thereof are truly remarkable. When one realizes what there is in them for the ardent golfer, if one is an ardent golfer, one is indeed stupid not to try to cultivate the stroke.

The ball goes away from the club, when the stroke has been properly played, with a lot of backspin. On account of the forward position of the hands and the consequent reduction of the loft of the club the first part of the flight is very low.

It maintains this low path for a considerable distance, rising very gradually until the pace begins to decrease. Then the backspin begins to exert its influence. In this case the lower portion of the ball is naturally the forward-spinning part. Therefore most of the friction is underneath. This friction now begins to force the ball gradually upward in a beautiful curve. Soon the power of the spin is diminished and as the force of the blow is also dying away, the ball, still with some backspin on it, begins to fall. The friction on the underneath side of the ball is now if anything shifted a little farther backward on the ball on account of the change of direction. This tends to keep the ball edging onward.

Now the backspin is almost exhausted, and when the ball finally pitches all that remains of it is probably instantaneously killed, for the trajectory of the ball, notwithstanding its rise toward the end of the carry, is always low. There is nothing therefore in this ball, notwithstanding its backspin, to prevent its being a good runner, which it frequently is.

An analysis of the beneficial qualities of the backspin and its application in this stroke will I think be found to justify my old-standing claim on its behalf. Firstly, its low carry is always a great point in its favor even in calm weather. Against

the wind it requires no recommendation. It was its great ability to face a wind that got this stroke, off the wood, its old name of "wind cheater." Now one hears *ad nauseam* of this stroke as "the push," but one may search any book on advanced golf for an explanation of this great drive or brassy shot and get but little for one's pains.

Off the tee it is a splendid stroke and it may with advantage be played from a high tee. This was regarded some years ago as a fanciful notion. A high tee for a low ball! Whoever heard of such an idea? Now one of the most famous of the continental golfers gets a consistently low ball from a high tee. It is obvious that if one tees high for this stroke one has a greater distance wherein to pass down across the ball. It is this passing down that gives the beneficial backspin of golf so those who want extra distance and a low ball from the tee may take a little more sand. This is merely another case of loft. If the face of the club is right at the moment of impact it will not matter if the ball is three-eighths of an inch off the ground or five-eighths.

After the low flight has served its purpose we see the backspin getting to work and assisting to raise the ball to the top of what one might almost call its secondary trajectory, and when the force of the blow and the spin together are no longer

enough to keep the ball up we see it, still with a low flight at the end of its carry, approaching the ground at an angle that will surely, on its striking the fairway, be sufficient to kill the remains of the backspin and ensure a good run. If any one can show me a ball that possesses the same ideal qualities for golf as this I shall have to readjust my ideas, but until then I shall remain loyal to this stroke and indeed to this class of strokes as the master strokes of golf, and this I believe is true of the strokes be they off iron or wood, half, three-quarter or full, for when we get into the restricted shot we find the influence of the backspin asserting itself on the ball's pitching, and thus giving the skilful player an amazing control of his approach shots.

I do not think that it is necessary for me to add anything to my explanation of the push shot. I have referred to Vardon's explanation of it in *How to Play Golf*. I speak now from memory, but there was something in that book that has always been a puzzle to me. Vardon refers to James Braid as being the greatest master of the push stroke. He may be. I never saw Braid get his low ball except with a slight pull. I have never seen him play a genuine push stroke, I never heard that he does it, nor have I ever read of his doing so, and in *Advanced Golf*, where one might rea-

sonably expect to find this stroke explained, he does not elucidate it, nor does he do so in *How to Play Golf*.

If Vardon is correct in his statement that Braid is the greatest master, amongst professional golfers, of the push stroke, he must recognize at once the hopelessness of his explanation of how to play the push, for Braid, in *Advanced Golf*, explicitly tells us that trying to do anything during impact such as that suggested by Vardon is quite futile.

Vardon's description in *How to Play Golf* of the manner in which the push shot is played is so remarkable that I reproduce it here. He says:

"While it is a shot for any club, the cleek is perhaps the best implement with which to begin practising it. Before proceeding to describe how it is done, let me explain in a few words the idea of the stroke. What happens (at least, so I feel convinced, although nobody sees it happen) is that the ball is made to spin slightly up the face of the club at the instant of impact. The golfer has no need to worry about producing this effect; it will come if he accomplish the shot properly. That is the essence of the shot; it produces the backspin while the power of the blow naturally sends the ball forward. Now as to the way to obtain the effect; a way that must be precise, although it

is not nearly so difficult a problem as it may look on paper. The swing must be distinctly more upright than for the ordinary cleek shot. The club must go up straighter than for any other stroke in the game, and, that being so, nothing more than a three-quarter swing should be permitted. The uprightness of the swing will demand a closer stance than for the ordinary cleek shot. The player should be several inches nearer to the ball because, instead of swinging the club round to it with a purely propelling action, he is going to endeavor to come down on to the side of the ball, if I may so explain it. This sounds, I know, only about one degree removed from an incentive to topping. It is likely that the golfer will go through a period of that painful purgatory in his early efforts to execute the shot, but it will be solely attributable to his failure to use his body and wrists in the correct way at the time of impact. It is quite clear that the simple propelling influence will not produce the essential backspin. The face of the club must come down broadside on to the ball so as to make the latter run up the face of the implement, thus imparting the spin while the forward movement is in progress.

"We left ourselves standing closer to the ball than for the ordinary cleek. The stance, too, should be distinctly more forward. In no circum-

stances should the hands be behind the ball during the address; indeed, they must be an inch or two in front of it. Moreover, the eyes must be focussed, not on the turf immediately behind the object, but on that extremity of the ball itself which is farthest from the hole. During the address, our range of vision, so far as we are conscious of it, should end half-way down the ball—on the pimple that is protruding farthest away from the hole (if we are using a ball of pimple marking). When we play an ordinary cleek shot, we graze the turf several inches behind the ball so as to make the loft of the club do its work immediately. With the push-shot, we obtain the loft in a different way. In an infinitesimal period something happens which produces back-spin before the action of raising the ball has time to take effect. What we want to do is to bring the instrument down so that the hindmost part of the ball is struck at a point of the club's face which is rather nearer to the sole than the top. In a way, then, we want to come down half on top of the ball. We have seen that our hands are in front of it, so that when the contact is made at the rearmost part of the ball (not under it), more than half of the club as between the sole and the top is tilted, so to speak, over the ball. I need scarcely say that this position is of the shortest instant's duration. We are not going to

stand and reflect on it; we have no time even to catch a glimpse of it. Nevertheless, the securing of it is the first essential of the shot; this is a fact upon which I imagine all good exponents of the push stroke have satisfied themselves.

"Now as to the simultaneous yet rhythmic movements which complete the shot. At the moment of impact (right at that instant; not the smallest fraction of a second earlier or later) the player should straighten the elbows, stiffen the wrists, and let the body go forward a few inches with the club. The quick action of the elbows and wrists will push the face of the club under the ball as both go forward, and the body moving slightly in the same direction will assist in the project. The ground will be grazed the smallest distance imaginable in front of the place where the ball was reposing. The follow-through should not be arrested; indeed, it should be encouraged, because the wrists and elbows must relax to the normal the instant they have executed the push; but, in the ordinary way, the follow-through will not be so full as in ordinary shots.

"I need scarcely say that the secret of success is to make the various movements synchronize to perfection. The arms must straighten, the wrists must tighten, and the body must move forward at the exact time when the club meets the ball. The

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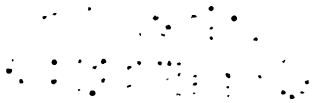
JEROME D. TRAVERS

Bunkered



effect will be readily perceived. The club-face will be turned under the ball, while picking it up cleanly. The two will be in contact for a period not long enough to be noticed, but sufficiently appreciable for the ball to run up the face of the implement as it is being urged forward. Thus will be produced the back-spin. A tight grip is necessary, and I may perhaps repeat the warning that directly the impact is complete the elbows and wrists should relax so as to facilitate the follow-through. They will have done their work.

"This description may make the shot appear like a piece of jugglery, but it is a faithful explanation of the stroke as I play it myself, and as I have seen others play it. From time to time I have observed in responsible papers articles dealing with the push-shot, and giving wrong impressions of its character. Thus I have read on more than one occasion that rudimentary mechanics prove beyond all question that, in order to raise a ball into the air and obtain an accurate and adequate flight, it is necessary for the club to make the impact below the center of the ball. I do not profess to know much about the science of mechanics, but I am sure that I know how the push-shot is played. If, at the outset, you were to strike the ball below the center, you would not impart much back-spin to it. You might obtain a little, but the effort

would be hardly distinguishable from an ordinary lofting shot. What you have to do is to bring the face of the club down to the ball at the center of its mass, and then, by that simultaneous stiffening of the elbows, tightening of the wrists, and pushing forward of the body, make the face of the implement run almost half-way round the ball. It has been said that it is impossible for me or anybody else to observe what happens at the instant when the club and the ball come into contact. I am free to confess that it is impossible to see the club hit the ball. Let me, however, discuss the matter from another standpoint. A good player always knows what he is trying to do, no matter what club he has in his hands. If he repeatedly hits the shots just as he tries to hit them, he knows that he is using the club and striking the ball in just the manner that he has conceived for the occasion. Otherwise we should have to arrive at the conclusion that all his satisfactory strokes were flukes, because he had endeavored to accomplish the thing in a certain way and had obtained the desired result by unwittingly doing something else. That, surely, would be absurd. Consequently, although it is true that I do not see the club hit the ball, I know that the push-shot is obtained in the manner which I have described. I have dealt fully with the subject, and endeavored to correct wrong im-

pressions, because I feel that the 'push' is now the master shot in golf, and the stroke which all good amateurs ought to practise if they take to heart the frequent reproach that the standard of their play is falling below that of professional golf."

One might perhaps be pardoned for asking, if the cleek is to "run almost half-way round the ball," what happens to the shaft of the club when the back of the club head, *during impact,* remember, is presented to the hole, and how it is possible, in such an event, for the ball to start its flight low, as this shot always does.

One would, out of consideration for Vardon, have omitted his wonderful description if he had not explicitly stated that the ability to play this shot well is the one thing that keeps the professionals' golf superior to that of the amateurs.

It then became my duty to submit his explanation of it and mine. I must leave it to the intelligence of golfers to decide which is correct.

CHAPTER XI

THE SLICE

THE slice is a very useful shot when one can control it. Unfortunately very few players can control it, although a vast number can produce it —when they do not want to do so.

Vardon is a great believer in playing his drive with a slice. It must not be thought when I say this that he produces what one immediately thinks of when the word slice is mentioned. On certain courses he puts a little slice on the ball. It is not a considerable cut as is the ordinary slice. It is just enough to be noticeable at the end of the ball's carry and it gives him, so he says, greater confidence in getting the ball up and away.

I am not mentioning this with the idea of encouraging those who cannot slice—and there are some—to cultivate the art, nor with the desire of solacing those who have the vice. The slice is a well known stroke in golf and therefore we must give it our consideration. Also if we see clearly how it is produced, it may assist some who have it—and desire it not—to shed it.

The slice primarily is a cut stroke. It is caused by the club engaging the ball as it crosses the intended line of flight to the hole.

In driving for an intentional slice the stance is much more open than for an ordinary drive and the ball is taken much more forward, about opposite the left instep. The right foot is nearly at a right angle to the line to the hole and the left foot almost points to the hole.

Directly the club-head leaves the ball it goes away farther from the player than the ball. It is raised outwards so that it goes up in a plane that will in the return stroke carry the club-head out beyond the line to the hole. This is the simple explanation of the intentional slice so far as regards the stroke. Of course practically all the things that I have explained in the chapter on driving take place in the slice. The main difference is in the plane of travel of the club's head in relation to the ball. This is caused principally by the alteration in stance.

The club-head in returning across the line to the hole engages the ball; and while the ball is still, as it is called, in adhesion, crosses that line, carrying the ball half flattened against its face for an appreciable distance. The ball does not leave the club until it regains its normal shape; in fact, it is regaining its normal shape that takes if off the

club. While this is happening, however, the ball has flattened against the face of the club as mentioned. The face of the club is inclined backwardly, and so the ball flattens on to it at this angle at its point of extreme compression which occurs about the middle of the full extent of the ball's travel—or roll—on the face of the club.

It may be interesting to state how this compression happens. I have never seen it stated in any book or paper, and I do not remember that I have ever before stated it myself.

We have all of us at some time seen the impression of the ball left on a club. Generally that is the clear cut brand of the compression caused by a straight hit and it gives one a good idea of the extent to which a golf ball flattens on to the club. The "picture," or impression, of a sliced ball is however quite different. The club naturally makes contact with the ball practically at a point, but it does not go on driving down a line that taken from the club through the ball would be in the plane of the ball's flight to the hole as in the plain drive. The club is crossing the line of the ball's flight. Therefore it engages the ball gradually and as it crosses it proceeds to roll it on the face of the club. The area of contact is very slight at first but it gradually broadens out until we get the full diameter of compression after which the

mark narrows off by degrees until the ball leaves the club with just about the same impression as it came onto it.

The mark tells us clearly what happened. The club touched the ball very slightly at first and began to roll it. Soon the weight of the blow was felt and the ball in the course of its roll across the face of the club became fully compressed and then it gradually regained its shape as it rolled off the club.

The mark that the ball leaves on a club is an irregular stunted ellipse. The point that I want my readers to remember is, however, the angle that the ball takes in flattening on to the face of the club during its roll or movement across it. It is reasonable to assume that this angle is the chief determining factor in settling the axis of rotation of the ball.

If we admit this we see then that the slice goes away spinning from the left to the right and with the axis of rotation lying back towards the player at an angle which is roughly the same as the loft of the driver or other club with which the stroke was played.

Sometimes the slice is played as the club is going downwards and across the line. This tends to tilt the axis of spin so that the top of it inclines a little toward the player, while the angle at which

it is leaning back is not appreciably altered. This point arises when we come to consider the reason for the slice being a poor runner.

A sliced ball swerves in its flight from left to right. The cause of this swerve is very simple and may be explained in a few words. On the left side—if I may use that word when speaking of a sphere—the ball has the sum of the two motions forward progression and forward revolution, for on that side the ball is spinning toward the hole. Thus, as Newton put it, the motions on that side "conspire" and they beat the contiguous air more vigorously than does the other side of the ball, where the motion of the spin is away from the hole. Every projectile naturally seeks the line of least resistance. It follows then that the ball edges over to that side whereon there is least friction, the backward-spinning side. This is a short and simple explanation of why the golf ball swerves in its flight.

Comparatively few players could explain what causes a slice and the resultant swerve which is so often disastrous. Is it likely that if one does not know how one is offending that one can take effectual steps to stop the offense? It seems reasonable to think that a clear idea of how the slice is produced must help any one who wants to do it, or any one who is doing it and desires ardently

not to do it. The golf stroke makes such an inexorable demand for accuracy that it seems to me that if one desires to excel, particularly if one has taken to the game late in life, one's best chance for success lies in knowing all there is to be known about the game outside of playing the strokes. Surely, if one brings to one's aid this knowledge, which cannot possibly, when sanely used, hamper execution in any way, one must have a better chance of success than he who insists on groping in the dark in the pathetic idea that he cannot take advantage of the accumulated work of those who have gone before him.

Golf really is not a game calling for a vast amount of intellect. If it were so, we should not see the men who are supreme at it where they are. None knows that better than they themselves. They have got where they are by a lifetime of imitation, by learning through the eye—probably the best way, too, if one has time enough, and lacks either the desire or the power to use some gray matter with one's strokes.

The real demand of golf is for extreme mechanical accuracy. There are many reasons for this. The striking face of the golf club is the smallest surface used for such a purpose in any field sport, the golf ball is the smallest ball used in any ball game, and, with the exception of polo, the ball is

farther removed from the line of vision than in any ball game that I can call to mind. It follows that the margin for error is extremely small.

Of course against these disabilities we have the fact that the golfer is always playing a stationary ball, but even when this is taken into consideration, it will be seen that there is not in the golf stroke much room for haphazard methods or guess-work, particularly when one is playing such a stroke as the slice, wherein, on account of the glancing blow, the margin for error is even less than in the ordinary stroke.

I am emphasizing these points here because one is frequently told, as we have already seen, by persons whose words ought to carry authority, that the slice is played by drawing the hands in towards one at the moment of impact. Nothing could be further from the truth and nothing could be better devised utterly to spoil the correct execution of the stroke. Such a performance would tend to arrest the club head at the very moment when it must be traveling, unrestrained in any way whatever, back in the arc which one decided on as its track the moment one started it on its upward journey from the ball.

This is the truth about the production of the slice. If any one is suffering from producing it consistently and involuntarily there are many ways

of trying to cure him; as many cures, I should say, as there are varieties of the disease.

The outstanding suggestion, of course, is to moderate one's stance, to get back by degrees to the normal open stance, or even, if necessary, beyond it. Again one's hands may be wrong and the grip may perhaps be altered with advantage, but each case has almost to be judged on its own merits. I have, however, cured many a case of slicing without even seeing the sufferer handle a club by risking the guess that he was not on his left foot firmly enough at the moment of impact, and by impressing on him most forcibly the importance of being solidly on his left foot at the top of his drive, in his case to have an extra fourteen to eighteen pounds on it if necessary over and above the weight on his right foot. This nearly always means bringing them "through" the ball and out after it a bit more than they are accustomed to. It is extremely easy to slice if one anchors the weight instead of letting it go down the line just as one is hitting the ball.

Another exercise that helps some people is to run a chalk mark in the line from the hole, to place the ball on it, and to drive from it, taking care that in the swing back the club never gets any farther away from one than in the address. If this does not correct the fault, start the swing by

coming in from the line of flight directly there is the least tendency on the part of the arms to pull the club-head in, which, if one is playing correctly, is almost immediately the club head leaves the ball. Theoretically the club-head leaves the line of flight and comes in towards the player's side of it the instant it leaves the ground, nor does it return to the line until the actual moment of impact; for the plane of the irregular ellipse formed by the travel of the club-head only coincides for a very short distance with the plane of the ball's flight. This is another reason for having a fairly comprehensive idea of what it is we are trying to do when we start driving; for unless we did move out bodies forward, as advised by Vardon, on to the ball, we should actually have the head of the driver in the line to the hole but for about an inch. We must therefore see to it that we try our utmost to cultivate the art of timing our bodies on to the ball but not on to the follow-through. That is a matter that will attend to itself.

We have seen now how the slice is produced, and what it is that causes the ball to curve away to the right. The spin on a golf ball, unless the ball has been grievously miss-hit, is nearly always dominated by the pace of the ball. It is when the pace begins to die away that the spin shows its mischievous qualities if there is enough of it to

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JAMES BRAID

Playing out of a Bunker

be mischievous. Then it is astonishing to see how the ball, especially if the wind assists it, will career away to the right and probably end by hiding itself in a most inconvenient place in the rough.

If however the ball should land on the fair green and not too near the edge of the course one has a fair chance of escaping trouble, for the slice does not run so freely as its more esteemed relation, the pull. The reason for this is not very generally understood, but it is simple, and may in some ways be helpful, so I give it here.

In dealing with what took place while the ball and the club were in adhesion I referred to the fact that sometimes the slice is played as the club is returning downwards and across the line of flight, and I explained the resultant tilt that is given to the axis of spin. It will be seen that in the spin of an ordinary slice the axis is almost vertical, but generally lying back a little. When it gets that little extra tilt I spoke of, the axis of spin of the sliced ball towards the end of its carry almost exactly coincides with the line of its flight. This is almost equivalent to having a peg top come down, let us say at an angle of thirty-five degrees and with the peg sticking out toward the spot to which it is going. Certainly the peg is not visible in the case of the golf ball. It is invisible, but the

effect is there—to a less extent, of course, but it is there.

Every spinning thing tries very hard to stay in the plane of its rotation. This is the secret of the gyroscope. The sliced ball is no exception to the rule. It strives as hard as it can to remain in the plane of its rotation. As the axis of rotation coincides with the line of the ball's flight it follows that the plane of spin of the sliced ball is squarely across the line of its travel, therefore the moment the ball lands that rotation fights to the last turn before it consents to allow the sliced ball to turn over in the way that will allow it to roll sideways off the course. This explanation may make a little clearer to my readers why it is that a properly regulated slice gives control of the run especially on heavy ground.

There is an exaggerated form of the slice that may more aptly be termed "a reverse pull" that produces a different effect on landing. In this stroke the ball, generally by accident, is struck more as the club is coming up. This produces a different effect on the run of the ball, which then has more of the nature of the pull in its run.

The outstanding characteristics of the sliced ball are its sudden rise, high flight, curve to the right and its restricted run. The sudden rise of the slice has not been satisfactorily explained. Per-

sonally (in addition to the fact that one frequently and unconsciously increases the natural loft of the club) I think it is attributable to the fact that the axis of spin is oblique, and that almost the whole of the forward and bottom part of the ball is revolving so as to get a lot of friction instead of, as in the ordinary case of a spinning ball, getting it only on one side. This I think must tend to push the ball up a good deal.

It would be easy for me to describe to you how to play dogs-legs and elbows, and around clumps of trees, and how to hold up against the sides of hills, all by the help of the slice, but I shall not do so. I have told you enough to assist you to learn and understand the shot. If you put it into practise to the extent of learning the stroke so as to be able to produce it in the rare cases where it really is the best stroke to use you will understand that I was wise to leave all that other stuff out.

CHAPTER XII

THE PULL

THE pull is looked upon by golfers in an entirely different light from that in which they regard its humble relative the slice. There is hardly the player traveling the links to-day who does not feel rather pleased with himself when he gets—generally more by accident than design—that long low ball that scoots out toward the rough on the right of the course, mayhap even over it, and then, toward the end of its carry, swings in toward the middle of the course and on landing runs like a frightened rabbit down the course toward the hole.

This may be a somewhat pleasanter picture than that which comes into the mind of the ordinary golfer when the pull is mentioned, but it is not, as any golfer knows, any exaggeration of the real stroke, nor of the pleasure in playing it, particularly when it has been done of knowledge and skill and not by chance.

The pull is most certainly a valuable and beautiful stroke. Every player who wants to rise to

the highest class should understand it and try to get it. A man may go a long time without really requiring to play a pull. At any time it may be *the one stroke* that will save the hole—or the match—for him. It is well worth knowing—and having.

Most golfers know the stance and address for the pull and many of them have a hazy idea about a particular grip, while a method of cocking up the toe of the club and turning it inward is alleged to produce the pull, but beyond this very few, unless they are lucky enough to have it naturally, can go.

For the benefit of those who do not know, I may say that the stance for the pull is almost the reverse of that for the slice. One addresses the ball very far back, so far back indeed that it is only three or four inches in front of the right heel. The left foot instead of pointing towards the hole now points towards the line of flight at almost a right angle, within, say, five or six inches of that angle. It is now advanced, and is nearer the line of flight than the right foot, which is eight or nine inches further from the line of flight than is the left foot and pointing away from the hole more than in the slice. The right hand is more behind the shaft of the club and the left hand has naturally moved round a little with it, otherwise the

grip is the same as in the ordinary stroke. This stance naturally brings the hands a little in front of the ball.

The swing back in the pull is much flatter than that of the slice. Immediately the club leaves the ball it begins to curve in and away from the line to the hole. This is the correct method of starting the stroke, although Vardon says that the club should be taken back as in the ordinary drive. Now I have told you the most important part of it. You have got your grip and stance correct and you have started your swing correctly. If you carry on now you can scarcely avoid playing the stroke properly.

You have started your swing back with the instant inward curve. That is going to make your swing flatter than usual, and your stance and address will make you, in the downward swing, played with all observance of the essentials of the proper drive, pass your club out and across the line of flight and slightly upwards during the all-important period of adhesion.

When I first explained this stroke in London it caused a furious controversy. It was claimed that my explanation was wrong and that the real cause of the pull was the turn-over of the wrists at the moment of impact. Any attempt to do anything of this kind would simply lead to foundering the

ball. It is not, nor ever was, practical golf. You will observe that as, in speaking of the slice, I said nothing of the turn under of the right wrist in the follow-through, so here I have no instructions to give about turning over the right wrist. It will do it of its own accord in the follow-through if you play the stroke correctly.

It is curious that it has never been asserted of the slice that this turn-under of the right wrist is done at the moment of impact; yet of the pull it is most obstinately asserted, in some quarters even now, that the turn-over of the right wrist takes place *during* impact. The fact is, however, that it follows the impact with such rapidity that the eye cannot distinguish the movement.

In England the controversy reached such a stage that some people got quite angry about it. I offered to give a public demonstration of the matter if the doubters would make the necessary arrangements and bear the expense, but this they would not do, so I settled it another way.

About this time I was writing *Modern Golf*, and I was using George Duncan to illustrate the strokes. He was then a comparatively unknown quantity; but in my opinion full of the highest promise, which he has since all but fulfilled.

Duncan is probably only inferior to Vardon as a stroke player, and I have a great respect for his

knowledge of the theory and practise of the game. On nearly every point he and I were of one mind. When it came to illustrating the pull, however, Duncan told me plainly that he did not agree with my explanation of it; that he was, in fact, in the enemy's camp.

I said, "Very well, George, I must show the stroke myself, but I would sooner have you. Now I shall tell you how you can prove that I am right without troubling me in the matter."

Then I gave Duncan instructions how to conduct a test that would give him an infallible answer. Any one who has any doubt about the manner in which the pull is produced can try it for himself.

I told him to make a mark on the grass with a spot of whitewash that would go through to the earth, or to make a small white line on the line to the hole, to place the ball on this, and then on the far side of the line and starting opposite the front of the ball to put up a row of matches or invisible wires at right angles to the line. This done, he was to address the ball and play a straight drive down the line to the hole.

He would thus discover when he had plenty of room for a straight drive; and he could verify his conclusions by driving another straight ball or two. This done, he was to count the number of matches or wires left standing, to replace the ball in exactly

the same place, and to play a pull. If he would come to me and tell me that under these conditions he could play a pull without knocking down more of his pegs than he had carried away in his straight drive I told him that I would give him twenty-five dollars for his trouble.

Duncan went into the matter of the pull and then he came to me and said that I was right. He made no attempt to collect that twenty-five dollars and I never asked him about his experiments. I do not know to this day what he did to satisfy himself; but I used diagrammatic photographs of him in *Modern Golf* showing that the pull is played as I say it is, and not as the books of the most famous authors describe it—for that is an impossibility; and we have James Braid's word for it, if corroboration of mine were wanting, for a fact that seems fairly plain, that one must not try to do anything to the ball *during* impact.

There is a very persistent idea with many golfers that the correct way to play the pull is to cock up the toe of the club, turn it in towards the hole a little, and then play the stroke in the ordinary way. This means, of course, that the player is relying for that spin, which is the essence of the pull, on the action of the obliquely placed face being driven down the straight line.

Some small amount of spin no doubt would en-

sue. Personally I do not believe that the players who address the ball in this uncanny manner get the pull in the manner they think they do, and I am prepared to give my reasons for this.

If the face of the club is turned over with the toe forward, and the drive then played in the usual way, I am sure that so far from starting the pull as a pull, it would go for what is called a pull in cricket—that is, a ball that is hit across the wicket, or, in golf, across the line of flight. I do not deny that a certain amount of spin may be got in this manner, but I do not think that enough of it can be got to make the stroke worthy of comparison with the true pull as explained by me.

It is not surprising that this idea should have such a strong hold. Some of the most eminent men have delivered lectures or written papers, which rank in the history of the game, wherein their assumption has been that the spin of a golf ball is obtained in a manner almost if not exactly similar, from a mechanical point of view, to that advanced as being the method of production in the pull.

The main difference between their contention and that of those who think the pull is got this way is that they believe the beneficial backspin in golf is obtained by the lofted face of the club passing swiftly across the intended line of flight of the golf

ball in the same plane as such intended line of flight, as for instance in the push stroke, whereas the pullers are merely, in effect, applying the same theory, but are endeavoring to tilt the plane of the ball's flight over, so that the "loft" would exert its influence mainly sidewise and not, as usual, vertically. The idea has arisen in each case, I believe, from a misconception that is fundamental, namely from an error as to the one and only function of "loft" in a golf club, which, as its name, "loft" or "lift" implies, is to get the ball up into the air. The other things have to be done by the player.

If this idea were sound I should have constructed and placed on the market special clubs called pullers, slicers and pushers with which one could play the same shot with three different clubs and yet produce the three widely different strokes named.

This really is not such a wild idea as it may seem. At one time I really had thought of it. If this method of cocking up the toe and turning the face over really is a good method of getting the pull why should one not experiment and get a club made so that when it is soled it is set just exactly right for the stroke. I think this club would sell—if it would do the work!

The idea of making the clubs as much alike as

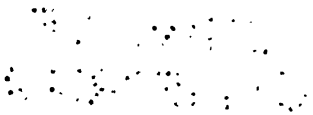
possible in weight, length, grip and every other way is good and will no doubt be carried much further in the future than it is now. Some years ago, when I had more time to spare than I have now, I made some experiments with a cleek. By taking the same cleek and putting the weight mainly at the bottom and then nearer up to the middle and finally a little higher one gets with exactly the same stroke three entirely different results. This is true in many important points of all clubs, and probably nobody would venture to deny the advisability of making the club do as much as possible in a game where the call for mechanical accuracy is so insistent as it is in golf.

Curiously enough, exactly the same delusion about the right method of obtaining top-spin exists in tennis as there is about obtaining the modified top-spin of the pull in golf. Numerous writers advise the player to wait until he feels the ball on the racket and then to whip his wrist up, thus giving a roll to the ball. Others again, amongst them an ex-champion of the United States, advises players at the moment to impact to have the face of the racket overhanging the ball—that is, with the top side of the frame nearer the net than the bottom. It is to me amazing that such manifest errors are allowed to go forth associated with names that do undoubtedly carry weight. What would be

JEROME D. TRAVERS

Stance and Address in Driving

Top of Swing in the Drive



thought of me if I suggested altering the loft of a driver into an overhang! Well, tennis has not a special set of mechanical laws for itself and if the ball is below the height of the net, whether it is in the air as a tennis ball, or on the ground as a golf ball, there is only one thing that will lift it to the place to which one desires it to go and that is loft. If it is not provided on the striking implement the player, as in tennis, must provide it or the ball refuses to go up. No overhang, in golf or tennis, can be of service in getting the ball up. There may possibly be a chance of taking a theoretical objection to this statement. Were the ball just a few inches below the tape a stroke with a vertical racket might, on account of the adhesion, carry it up so that it would go over, but even here we should have to admit lift, if not loft.

Both in the drive with top-spin in tennis and in the pull in golf the turnover of the right wrist has nothing whatever to do with the production of the stroke. That comes in the follow-through, after the ball has gone on its way, if one has played the stroke correctly. An enormous number of returns are foundered, put into the net or in many cases on to the court before the net is reached, because players think that this turnover of the right wrist comes in at the moment of impact, and consequently they get it in much too soon. This

is a fine illustration of the fact that one must not attempt to do anything whatever to the ball during impact either in golf or tennis. What happens then—I cannot say it too often—is merely an incident of the stroke itself.

It is worthy of mention that in *Advanced Golf* James Braid shows by photographs the actual moment of impact in the pull. There is no sign whatever of any turn over of the face of the club in this picture, nor does Braid in *Advanced Golf* make this statement about the turn-over, although he did in an earlier work. I should think that we ought to be able to take this as Braid's considered opinion; for the photograph is obviously posed, and Braid would have been sure to show such an important matter as this turn-over distinctly and to comment on it. On the contrary, we find him showing that the club returns to the ball naturally as in the ordinary address for the pull; from which it is evident that Braid now is satisfied that he gets his fine low ball by swinging out across the line of flight—as indeed nobody who has stood behind him and seen him play it could doubt.

There has at various times been much argument as to the difference in the flight and run of the pull and the slice. We shall have occasion probably to consider this matter again in dealing with the

flight of the ball. It seems proper however here to explain the peculiar characteristics of the flight and run of the pull.

As we have seen the pull is produced by an upward, outward, glancing blow. The ball goes away spinning on an axis which lies over with its top end nearer to the player than the bottom. I must make this as clear as I possibly can so I must risk being precise here. Let us suppose that you have just succeeded in playing a perfect pull. Now suppose that I am capable of arresting the flight of that ball, without interrupting its spin and that I get you again to take up your stance and address and replace the ball as it was before you hit it. You know as well as I do that it would spin for a very little while and then subside, but before it does this I want you to allow me to exercise my powers of imagination or necromancy by changing the spinning ball into a boy's peg-top still spinning.

I shall now show you the angle at which that top is spinning by placing it where the ball was. This is the instant you have to consider. You have no concern beyond that, for things would change in a way that does not come into golf. You have however, seen the top placed down in front of your club and at that instant what is happening is this. The top is spinning in such a way that the peg

is further from you than the head. The head is lying inwards towards you in such a way that if the peg ran right through it it would cross the place of impact on the face of the club at an angle of, roughly say, fifty degrees.

You will thus see, when you reconvert the top into a golf ball, and send it careering on its way that the right side is the forward-spinning side and that the ball is spinning about an axis, which gives it a spin that is not really top spin, but is yet very near to it; in fact, a spin which may justly be called modified top spin. As we saw in the case of the slice the forward-spinning side gets most of the friction. In the pull this is the right side, therefore the ball is gradually edged over towards the left side. The angle of the axis of rotation in the pull is probably greater than I have stated. Were this not so there seems to be a great probability that this fine ball would yield to the seductive influence of gravitation more speedily than it does.

Top spin has no place in golf. It is quite useless in this game. The nearest we get to it is in the pull. Ordinary top spin, as many of us know to our cost, simply means a vicious duck and some run, but it is useless. In the modified top spin of the pull we see however considerable benefit. When the ball lands the spin is still working; and

on account of the angle of the axis of spin, which lies right across the plane of flight, the ball runs well until the power of both the stroke and the spin, which in this stroke cooperate, is exhausted.

The simplest explanation that I can give of the plane of spin of the pulled ball on landing and of its run is furnished by one of the old chameleon tops or any similar disc top. Every one has seen such a top at the end of its spin wabbling about until the outer rim touches whatever it is spinning on. Then it grips the floor or table and runs away across it. That is why the pulled ball in golf runs so well, and if one takes the peg of any of these tops as representing the axis of spin of the pulled ball in the air one will have a very good idea of what is going on during the carry.

I always call the spin of the pull "modified top spin." I cannot get anything to express it better. It always seems to me that this is a ball with an admixture of top spin *that does its ducking sidewise,* but at the same time I am more than half inclined to think that at the beginning of the flight there is a good deal more cross spin than top spin. Probably, however, the axis of spin is altered slightly during the flight and almost certainly on impact the ball is thrown more into overspin than it was originally, for the lower end of the spinning axis is the first point to be arrested. This

naturally throws the top end forward and more across the course, thus correcting to a certain extent the natural tendency of the ball to run off the fairway.

CHAPTER XIII

THE EYES

THERE is some advice that is given to every golfer or player about his eyes and the ball. Every book loudly insists on it, and if anything goes wrong with any part of the swing any one who can think of nothing else to say says it. I should like to see if it is possible to deal intelligently with the function of the eyes, and also to avoid using this parrot-cry of the links.

One of the main essentials when playing a stroke is to keep one's head still. This is not so clearly and forcibly insisted on as it should be. One is reminded frequently and forcibly of the importance of sustained visual operations in relation to the ball, but those who insist on this quite lose sight of the fact that staring at the ball is not really very useful if one is moving one's head about, up or down, or backwards or forwards.

It will be seen that one could concentrate on the unoffending little ball a glare of fixed intensity that would cause any ordinary man to wilt, and could sustain that gaze for "quite some time,"

but it would be fruitless, if while this was going on (and contemporaneously the gazer was driving) he was elevating and depressing the part of his anatomy wherein are fixed his hypnotic instruments.

Obviously then the thing that really matters so far as regards the eyes is that the head must, during the stroke, be kept in the same position as it was in at the address and must not be moved until the stroke has been played.

This is the soundest of sound theory, and despite the fact that our weight has to be moving on to the ball just before the moment of impact it is probably so near actual practice that we may accept it as what we all do when we are doing the right thing.

It really is not necessary that the eyes should be directed towards the ball at the moment of impact for they have fulfilled their function long before the clubhead reaches the ball. The arc in which the clubhead is to travel is irretrievably settled before the club has got within two feet of the ball and the eyes are to all intents and purposes out of business. This is where the trouble comes in. We all know the little saying about somebody finding mischief for idle hands. Well, it's just the same with idle eyes. Having nothing else to do in the stroke they naturally want to look at the result of their work. That would not be

so prejudicial to the stroke if they were located anywhere else than in the head or if they would move independently of the head. Unfortunately they do not. When they cease to regard the ball and look up the head goes up too—so does the stroke. Therefore we excuse the parrot-cry for it conduces to good golf.

We must remember that *once we have settled to our stance and address and the club has left the ball the head should be as immovable as if it were held in a vise.* The feet also are fixed in their position, any moving they do being practically just up and down at the heel, so that all the movement of the golf stroke takes place, until the follow-through begins, between three fixed points, the head and two feet.

Harry Vardon declares that he can address the ball and then drive it nearly as well with his eyes shut as when he is looking at it. I have many times seen a young American professional address the ball, shut his eyes and drive truly and well with his face turned up to the sky. It was really quite amusing and instructive to watch him. If scientific experiments were conducted we should be surprised to find how soon in the downward stroke the eye ceases to be required.

It would, however, be unwise to insist too much on this; but it is just as unwise to go to the other

extreme, as do so many famous players, and persist that it is not only necessary but advisable to continue gazing at the place where the ball was when it has gone. This is really bad golf and cannot be defended on any ground except that "The greater includes the less" and that if we teach them this we may induce them to keep their heads still until they have struck the ball; a thing which, in itself, though surrounded with much clatter and untruth, is good.

I have pointed out in various places that it is quite wrong to continue turf-gazing after the ball has gone. There is nothing to be gained by doing this, and much to be lost. If one continues to look fixedly at the place where the ball was one must miss much of the pleasure of one's noblest efforts. There is of course another aspect. One may be saved some pain, but let us not dwell on this.

The quite serious side of this long-continued regard is however that in sustaining it one is almost sure to keep the head still. This means that one's follow-through is interfered with, for a rigid neck and head must interfere with the shoulders.

I am glad to have Vardon's support in this important point. At page 174 of *The Complete Golfer* he says: "But I do not approve of keeping the eye fixed upon the place where the ball lay, so that the grass is seen after the ball has

departed." He says that you must fixedly regard the ball—I refuse to quote his exact words as they would defeat my expressed endeavor when I started this chapter—"until you have hit it, but no longer. You cannot follow through properly with a long shot if your eyes remain fastened on the ground. Hit the ball, and then let your eye pick it up in its flight as quickly as possible. Of course this needs skilful timing and management but precision will soon become habitual."

This is undoubtedly sound practical golf. I am inclined to think that many American players disregard it and that their long game suffers for it. Stopping the head must inevitably tend to shorten one's stroke and, moreover, it will probably affect adversely one's direction. I am not sure that this is the outstanding fault in American driving but I have seen a very great deal of it, perhaps not enough on which to condemn the follow-through generally, but still quite enough to justify my calling attention to the point.

Some people may doubt what I say about the eyes finishing their function so early in the golf stroke. The duration of impact in the drive has been measured by an eminent scientist who computes it at one ten-thousandth of a second. We can readily understand that the golf club is traveling at an extremely rapid rate. Can any one

imagine that it would be possible, at say eighteen inches from the ball, to readjust successfully the line of travel of the club-head, to alter the arc in which it had been traveling and to start it going in another without absolutely ruining the stroke? I should indeed require some imagination to believe in this reconstruction. If this cannot be done it seems to me to be undoubted that the eyes really do fulfil their function extremely early in the golf swing, in fact much earlier than I have indicated.

Consideration of this point naturally causes one to come to the conclusion that there is in the drive of a vast number of golfers a period before impact during which they do not see the club. I have no doubt that in Vardon's drive there is a period equal to five or six inches, just before impact, during which he never sees the ball. I have no doubt whatever of this. This golfer's "blind spot" exists even with the most accurate players. It is found in nearly all sport. It is in tennis very marked. The cricketer knows it to his cost. In tennis it is astonishing how few balls one sees, not *on* to one's racket, but to within three or four inches of it. Of course we all know the old slogan; and we also know how it is honored.

This blind spot exists also in la-crosse, rackets, polo, base-ball, hockey, and even in billiards; but it is almost certain that it becomes less the farther

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JEROME D. TRAVERS

Top of Swing in the Drive

This picture shows too much weight on the right leg, bad pivoting on the left toe, the left arm too straight and the right elbow too high

away from the eye the ball is played. It is probably least in polo; and after that there is less of it in the golf drive than in any other game. This is very fortunate for the golfer, for he already has enough with which to contend.

CHAPTER XIV

THE SHORT SWING

"WHY is it that they like to swing so much and waste so much power, unmindful of the fact that the shorter the swing the greater the accuracy?"

This is a question that is well worth while pondering. He who asks it is Harry Vardon. Certainly he is speaking about the cleek and the driving mashie, but the question may just as pertinently be asked about the wooden clubs.

I have already set out the principles and practise of the drive as played in what is considered the most perfect form by men who have spent their lives on the links, and there can be no doubt that the golf drive when well played in the manner described is a very satisfying hit, but to play a good game round about the eighties and occasionally quite a little lower it is not necessary to do it that way.

I myself always had a very free swing, partially due in all probability to the defective teaching of the old days, which encouraged the bad habit of

relaxing the grip with the right at the top of the stroke. The teaching then was: grip for all you are worth with the left and play about with your right—or "words to that effect," as the constable always says when he is giving evidence. At the top of my swing I could see the toe of my club out of the corner of my left eye, without trying, and at the finish it was knocking about my right knee. When you get them well with a swing like that they go; but I protest that there is about twice the necessary energy and half the requisite accuracy in such swings.

In no other game that is known do men use such a length of stroke as in the golf swing. If we regard the striker as a vertical pillar coming out of a horizontal plane we shall find that in almost every field sport the blow is struck from about an angle of forty-five degrees above the shoulder, that is to say the arm and the striking implement are raised to an angle of about forty-five degrees with the vertical. In the golf stroke the club is carried back at least to the horizontal and often below it, making in some cases a half circle over and above the stroke usually required in athletic games.

I know the answer that golf is a law unto itself —which it is not—and I am not going to argue the matter here. I am merely going to set out, for the benefit of those who cannot do the full swing,

a few things that I know about the short swing and some things that I have seen done with it.

Firstly, be it known that a man can get all the length necessary for a very good game with what is generally called a three-quarter swing, and without lifting his heels from the ground. This three-quarter swing goes up about as far as a tennis racket does in an ordinary stroke. The arms go little if any beyond the angle of forty-five degrees I have already referred to.

The stroke is in all ways played as nearly in conformity with the rules for driving as may be. It is a very upright stroke. It ceases when it begins to be inconvenient by pulling at the left heel. The left heel does not, as in the proper golf stroke, rise at all, or if at all, very little. As the heels do not move the weight remains at the top of the swing equally distributed.

The stroke is, if anything, more of a hit than the ordinary drive. Being so short and upright, and the player using very little foot work, there is a great tendency to hit downwards. This gives the greatest of all drives the wind-cheater, the drive with back-spin.

This stroke is not an obsolete stroke. It is a stroke of which no man need be ashamed. It is specially suitable for old men and stout people; and when playing it they need not pity themselves

for their lack of form. Rather let them congratulate themselves on being pioneers, for ere long many thousands will be following their example. This is a method of execution that one would want much courage to recommend in preference to the orthodox, but there cannot be any doubt whatever that many a man who takes to the game late in life, who would otherwise never be any good, may by this means become a very proficient player.

There is one man in New York to-day who blesses the short swing. He is well along toward middle life and a few months ago he was dubbing around in a hundred or thereabout. One of my disciples whose girth absolutely prohibits him from playing anything but a short swing coaxed him into giving up his erratic stroke and using the short swing. He is a long limber chap who ought to be able to play the usual game well enough, but I suppose it was starting late that bothered him. Well, he took to the short swing. It acted like magic. Within a few weeks he was down to eighty and how far he goes below that, and what he occasionally does now I am not going to tell you. It sounds too good and it might cause disappointment. The change may not suit every one so well; but it certainly worked wonders in his case. Any golfer, who is really in trouble, and wants to abandon the orthodox swing for the short swing, may know at

first-hand how great a change was made in this case.

It must not be thought that because one takes to the short swing one needs to abandon all foot work, because this is not so. In speaking of the flat-footed method I have in mind those elderly or stout people for whom much foot and ankle work is inadvisable.

Many years ago, before I ever thought of writing a book on golf or anything else, I had a useful lesson on the value of the short swing. The champion of our tennis club was one of those men who have a particular faculty for games. He was not robust but he had a splendid eye and a wonderful sense of touch. He was also a fine billiard player.

About this time golf was introduced into our town. He stood the talk about it for a year or two, then said that he must get after them in self-defense. He joined the golf club. They chortled in their glee at his swing. He simply played his tennis stroke at the ball. His club was practically never off the line. They said he was all wrong. He was in the habit of thinking for himself. He directed their attention to the fact that with much less effort and fuss he was getting further than their strong men—and much straighter. He gently explained to them that his theory of the

golf drive was that it was an exaggerated put and that he intended to get his results with the least possible exaggeration and exertion. They laughed much, but he went on his way unperturbed. One by one he took their scalps, and soon he was the local champion. This, bear in mind, was not the case of some poor old man. It was that of a man who at the time was good enough, and young enough, to win the tennis championship of New Zealand, one of the finest players who ever handled a racket. Certainly his style was not so pretty as some of the others, but it got the results—and that is what most golfers want.

"Short swingers" are very often "put tappers." I do not know if it is a matter of stroke affinity. There is such a thing. What one's service is in tennis that almost invariably is his smash. That is to a certain extent natural, for one's first stroke is the service and the service and the smash are virtually the same strokes.

My reason for mentioning this is that very often the elderly golfer can improve his game very much by swinging *less* in his *drive* and *more* in his *put*. This reversal of things has rescued many a man from the abyss of golf despair.

CHAPTER XV

THE POWER OF THE LEFT

THE hoariest old tradition that ever fastened on to golf was the power of the left. It was more than a tradition. It was a fetich. Authors and journalists worshiped at its shrine. Golfers and would-be golfers yielded it the most absolute obedience, at least in word and thought, although so many of these performed so exceedingly well with their clubs that there is grave doubt if they put their religion into practical use, even as it is today with many other religions.

I have already referred in passing to this most persistently fostered and very injurious idea. It is not indeed remarkable that this very great mistake has been handed down and kept going through the years. Practically every great golfer has succumbed to the fairy tale. Now, in this matter I want to tell you quite plainly that there are no half measures with me. This is a straight clean-cut issue. When I have said what I have to say on this matter you are for me or against me on a matter that is another of golf's fundamentals, that

is of importance equal to, if not greater than, the question of the distribution of weight at the top of the swing. I shall present to you a mass of authority in favor of this superstition. I shall tell you what I think about the subject and, so far as you personally are concerned, I must leave the verdict in your hands although truth to tell I have small doubt as to what it will be.

We must in the first place see what the great golfers have to say about it.

At page 61 of *The Complete Golfer* Harry Vardon says: "The grip with the first finger and thumb of my right hand is exceedingly firm, and the pressure of the little finger on the knuckle of the left hand is very decided. In the same way it is the thumb and first finger of the left hand that have most of the gripping work to do. Again, the palm of the right hand presses hard against the thumb of the left. In the upward swing this pressure is gradually decreased, until when the club reaches the turning point there is no longer any such pressure; indeed, at this point the palm and the thumb are barely in contact."

Let me say before I forget it that I earnestly advise every one to forget the tight and loose finger "dope." This is golf we are dealing with, not music, and the shaft of a golf club does not respond to this treatment as do the strings of a violin or

a banjo. There is quite enough to think of during the golf swing without trying to hand out piece work to special fingers. If I wanted to make you think that I know much more than I do about golf I should start analyzing the finger hold and apportioning the special duty to each joint. Such stuff is mere futility. At the top of the swing grip as fast as sin sticks to normal man and never let up, never think of anything else but hitting the ball until it is sailing away.

I know one professional whose great pride it is that he lets his forefinger wave about while he is playing his stroke. He has his reasons for it. I forget them, but probably he uses it to point out where the ball ought to go—but does not.

If Vardon really did these funny stunts, what he has done with them would have to command one's respectful attention; but when one knows that this great player will not *say* this foolishness to one, has one to swallow it because an enterprising publisher hired a wordy journalist to make a book of a certain size to take its place in a certain series. I think not; nay, so far as I am concerned, I know that I shall not, as they say in America, "stand for it." The comfort and convenience of the great body of golfers are of much greater importance than a question of publisher's royalties, and I am convinced that Vardon him-

self would wish to stop this out-of-date doctrine from affecting the game prejudicially.

Vardon continues: "The release is a natural one, and will, or should, come naturally to the player for the purpose of allowing the head of the club to swing well and freely back. But the grip of the thumb and first finger of the right hand, as well as that of the little finger upon the knuckle of the first finger of the left hand, is still as firm as at the beginning."

From this you will observe that you are still gripping firmly at each side of your hand, that is to say with the little finger and the forefinger and easing up or playing about with the second and third fingers. Try it, brother golfer, put your mind into it during your stroke, then try to get it and use it subconsciously, or do the right thing —and forget it.

Vardon does not anywhere expressly say, so far as I know, that the left hand and arm are the dominant factors in the golf stroke, but right throughout his work he infers that they are.

At page 126 of *The Complete Golfer* he says, speaking of the approach shot with the mashie: "This is one of the few shots in golf in which the right hand is called upon to do most of the work, and that it may be encouraged to do so the hold with the left hand should be slightly relaxed;"

and at page 147, in treating of putting, he says: "But in this part of the game it is quite clear that the right hand has more work to do than the left."

The curious thing is that, notwithstanding these statements, there is not in *The Complete Golfer*, nor so far as I know in any other well-known work on golf, a specific description of any stroke wherein the work is done mainly by the left hand and arm.

There cannot be any doubt, although he does not say so in so many words, that Vardon wishes to convey the idea that the influence of the left hand and arm is predominant in the majority of golf strokes.

We must now turn to James Braid for light on this subject. At page 55 of *How to Play Golf* we find: "A word about the varying pressure of the grip with each hand. In the address the left hand should just be squeezing the handle of the club, but not so tightly as if one were afraid of losing it. The right hand should hold the club a little more loosely. The left hand should hold firmly all the way through. The right will open a little at the top of the swing to allow the club to move easily, but it should automatically tighten itself in the downward swing"—which by the way, I may say, that Vardon very wisely warns one against,

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FRANCIS OUIMET

Top of Swing in the Drive

for the obvious reason that one is practically sure to go into the tightening up process at an inconvenient moment.

If I were not a person of infinite patience and some degree of civilization this kind of stuff would make me write things that I know that I should never dream of wanting to say to Braid or Vardon, for the very good reason that they would never make the curious statements that are ascribed to them.

This "opening up" of the right hand at the top of the swing is wrong, absolutely wrong. Braid himself in another book says so. Let us turn to what he says about the top of the swing in *Advanced Golf:* "Now for the return journey. Here at the top, arms, wrists, body—all are in their highest state of tension."

Now how can "arms, wrists, body," all, be "in their highest state of tension," if the right hand is to "open a little at the top of the swing to allow the club to move easily"?

The instructions are absolutely contradictory. I may therefore be excused if I take the liberty of saying that all advice from any one about easing up and fooling about in any part of the golf swing before impact should be forgotten. It is business from the moment one picks up one's club after addressing the ball; and at the top of the

drive it is tension, the highest tension from the word "go." In fact to quote Braid "hard at it" from the beginning of the downward swing.

How is it possible for the right hand to "automatically tighten itself in the downward swing" if it is already in its "highest state of tension," when it is at the top of its swing and Braid gives explicit instructions that it must be kept in this condition until the moment of impact?

Braid at page 57 of *Advanced Golf* says of this part of the swing: *"Every muscle and joint in the human golfing machinery is wound up to the highest point."* The student of the golf swing will do well to remember this sentence. I have put it in italics. Remember also that Braid is speaking of the start of the downward swing. Remember too, if it is correct, as it practically is, that there is nothing here about slack fingers or a predominant left hand but just that "every muscle and joint" is in it and is "wound up to the highest point."

Now we must take the testimony of J. H. Taylor. At page 193 of *Taylor on Golf* we are told: "My contention is simply this: that the grasp of the right hand upon the club must be sufficiently firm in itself to hold it steady and true, but it must not be allowed on any account to over-power the left. The idea is that the latter arm must exercise a

predominant influence in every stroke that may be played. As regards my own position in the matter, my grip with either hand is very firm, yet I should hesitate before I told every golfer to go and do likewise."

I am surprised to note Taylor's hesitation. If his method has been good enough to give him his great position, why is it not good enough to recommend to those who look to him for guidance? For if ever there was a famous right hand "punch" in golf it is what Taylor gets out of his trusty right forearm.

Taylor really is the worst offender of the Triumvirate in advocating the use of the left; and the curious thing is that of the famous three he is the outstanding example of a right-handed hitter.

At page 107 of *Taylor on Golf* he says: "The club is brought down principally by the left wrist, the right doing very little until the hands are opposite the right leg, when it begins to assert itself, bringing the full face of the club to the ball."

Vardon says that any attempt to do this is fatal. Braid says "hard at it" from the top and in supreme tension. Taylor grips very firmly with both hands. Where, oh where, can this easing up and tightening up and bowing and scraping, the right to the left, come in? The answer is

nowhere. It is one of the useless traditions that have been copied out of one golf book into another without proper thought or analysis.

Bear with me yet a little while, for this may mean no less than a revolution of your game and I want you to hear what the greatest golfers have to say before I show you some of the points which seem to me to bear on it.

Taylor is most emphatic about it. At page 90 of *Taylor on Golf* we read: "The right hand is naturally the stronger of the two—much more powerful in the average man than the left—and the learner is just as naturally prone to use it. But in the game of golf he must keep in front of him at all times the fact that the left hand should fill the position of guide, and it must have the predominating influence over the stroke.

"That this is rather unnatural I am perfectly willing to admit. Its being unnatural is the basis of its great difficulty, but it is a difficulty that must needs be grappled with and overcome by any man who desires to play the game as it should be played."

Well, Taylor himself has *not* grappled with it and overcome it; yet there are very few who would be bold enough to say that he does not "play the game as it should be played."

Is it not curious how Vardon wants us to search

for the particular style of putting Dame Nature put up for us and Taylor wants us to fly in her face and shoo her away? Verily in the trinity of counselors there is confusion.

In the volume on Golf in *The Badminton Library,* Mr. Horace Hutchinson says at page 85: "Since, as will be shown later on, the club has to turn in the right hand at a certain point in the swing, it should be held lightly in the fingers, rather than in the palm, with that hand. In the left hand it is to be held well home in the palm, and it is not to stir from this position throughout the swing. It is the left hand, mainly, that communicates the power of the swing, the chief function of the right hand is as a guide in direction."

Again at page 87 Mr. Hutchinson continues: "So much, then, for the grip. Now, when the club, in the course of its swing away from the ball, is beginning to rise from the ground, and is reaching the horizontal with its head pointing to the player's left, it should be allowed to turn naturally in the right hand until it is resting upon the web between the forefinger and the thumb."

Mr. Hutchinson is a well-known golfer and golf writer in England, and I do not know any English golfer whose opinion would be received with more respect than his; yet we see that he subscribes to the popular idea of the power of the left. At

least we have here his written statement and I have not seen any recantation of it.

It will indeed be hard to fit in James Braid's instructions in *Advanced Golf* with Mr. Hutchinson's ideas.

I have now shown you the ideas of three of the greatest golfers of all time and of one of England's most distinguished amateurs. Surely this is a weight of authority to stagger up against. Perhaps my best way is to tell here how I did it in London.

I wrote an article which was published in *The Evening Standard* called, if I remember, "The Power of the Left," in which I ridiculed the moldy old idea. To my surprise, on opening my paper I found the main leader, or as we say in America, editorial, devoted to my article and saying that I was putting forth what was actually "a new dynamics in golf" and much more to the same effect.

Then I was in the thick of it. Anybody who bursts up any useless old tradition, or even gives it a bump, in London, is a fool, a faddist, a theorist, or a revolutionist. If he does not recognize this before he disturbs any of the dust of centuries, and if he is not prepared to accept the position kindly and patiently—and temporarily—he deserves all that is coming to him—and that is much.

Much came to me, both in poetry and prose. I give here a sample of the poetry. This was published in *Truth*. I thought it rather amusing. At light verse of this description some of the English writers are extraordinarily good.

THE LEFT HAND'S LAMENT

(Picked up on the links at St. Andrews)

Since first by Heaven's august decree
The Royal Ancient game was planned
I always was allowed to be
The Master Hand.

To me did textbooks all allot
The part of propulsative strength;
The raking drive, the brassie shot—
I gave them length.

The Right Hand was—poor thing—designed
To guide the club, and that was all;
Mine was the power that lay behind
The far-hit ball.

Now comes there one upon the scene
Whose heresy fair turns me pale,
The Arius of the golfing green—
A wretch named Vaile.

He says our Vardons, Braids and Whites
Don't golf's dynamics understand;
Their view of me's all wrong; the Right's
The master hand.

If fate would let me but devise
Some torture for this villain bold
Who thus would revolutionize
Golf's credos old.

Oh, then to ball of rubber core
I'd change him for a tidy spell
And drop him in "The Swilcan" or
"The Burn" or "Hell."

I'd lose him in the rock-strewn sand
Whence few topped spheres ejected come
Of Musselburgh's notorious Pand-
Emonium.

What I had to put up with in prose was not nearly so amusing and it was not at all clever. The new idea had stricken the golf writers stupid. They wished to know how *I* could possibly know, for I hadn't found it out in Fleet Street.

When some degree of calm had been restored, *The Evening Standard* published an interview with George Duncan in which the famous young Scotchman not only said in the most unqualified manner that I was right, but gave the golf public something else to think over.

I have already indicated that Duncan is of an inquiring turn of mind. When the controversy started he went out and drove many balls, some with both hands, some with his right alone, and

some with his left alone. He found that driving with the right hand only he could get nearly as far as with both hands and that his direction was practically as good. He found that his attempt to drive with the left hand unaided was practically a failure both as regards length and direction. I pity the person who is foolish enough to try to argue this dour young Scot into the idea that his left hand is more useful to him in the drive than his right.

There is one question on which I always upset the left-handed theorists. They argue that the left is the predominant influence and so on, after the manner of the golf books. I then ask them, if this is so, why left-handed players always, or practically always, throw away this inestimable advantage of having their most important hand placed by our good old friend Mother Nature in the most important position, turn themselves round and get special clubs made for them, and moreover use them *mutatis mutandis* in just the same manner as we poor right-handed players do. They never have a satisfactory answer for this. When in addition to this I ask them how it is that neither professionals nor books ever advocate the practise of left-handers learning the game with the right-handed clubs, they begin to display signs of res-

tiveness; and I know that it is advisable to change the subject to the beneficial effects of irrigation—which generally goes better about this time.

I say, without any qualification whatever, that all this stuff about the left being the predominant partner in the golf stroke is false teaching of the most pernicious nature. The right hand and arm are undoubtedly the predominating force, but just as certainly as this is the fact, so is it absolutely essential to good golf that once one has realized this eminently sensible and natural arrangement one shall immediately forget it, for this is where it is right to leave it to Mother Nature. This is one thing in golf in which one may trust her absolutely and never regret it. It should no more be on one's mind that the right is master than is the problem as to which foot one is using at a particular moment. The matter is so perfectly adjusted and regulated by nature if the mechanical details of the swing are attended to that any conscious attempt to think of the relative power of either hand, arm or wrist is a work of supererogation, and in golf there is no room for anything like this.

The mischievous thing about the fetich of the left is, that as Taylor says, it is unnatural. One has to think always to do anything that is unnatural.

It is not the interference of the right arm that is to blame for thousands of ruined strokes that go down to its discredit. It is a case of giving a dog a bad name. The left really is in a vast majority of cases the guilty party without its guilt ever being suspected. It has heard the old, old story of the vice of the right, and it is always on the look-out for a chance to slip in in front of it and frustrate its evil designs on the ball. I need not detail the woful results in slices and loss of distance that ensue.

A chain is no stronger than its weakest link. Speed is of the essence of the golf stroke. It stands to reason that if the right has to wait on the left we are going to lose speed and after what George Duncan has shown us we can have little doubt about which arm furnishes the greater power.

If we have established the fact that the right is the dominant partner in the swing it seems that it strengthens my remarks about the new overlapping grip which gives the right hand a fuller grip of the club than the left. When I know a thing, or am fairly sure about it, I have no hesitation in stating my opinion. If I know it, or think I know it, I sometimes state it rather positively. If I am only fairly sure I put it forward tentatively, as I am doing in this matter of the new grip, but there

are two points about it which I think are worthy of consideration.

In the present grip, at the moment of impact the left hand is farther from the ball than the right. At the same time the right hand, which is necessarily the nearer to the ball, has a less full grip than the left as the little finger is placed upon the forefinger of the left hand. It is always the shaft horse that bears the load. Which is the shaft horse as between the left hand and the right; and since when, pray, has it been good harnessing to put the saddle on the leader?

As bearing on this question of the right-handed grip being made fuller than in the ordinary overlap I may tell an interesting anecdote. Some years ago a golfer who was good enough to remove Mr. John Ball from the Amateur Championship lost his left thumb at the second joint. After his misfortune he found, much to his surprise, that he was driving a much longer ball than he was getting before.

The golf scribes were much exercised over this, but nobody suggested any explanation. The one that readily suggests itself is that his accident put his right hand into a more natural place on the shaft than it had had before and closer to his left hand. If this golfer were to use the overlapping grip suggested by me he would probably have an

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ideal golf grip for he would have a full right hand hold, be close up against the left without any interference by the thumb, and by overlapping with his left fore-finger on the right little finger he would bring the wrists well together. I am afraid that the grip, obtained in this way, will never be popular; but, without sacrificing any portion of one's anatomy, the new grip is well worth an intelligent and exhaustive trial, especially by those who favor the short swing, for, as I think I have pointed out, if one grips like this and holds the club firmly throughout the swing, it is practically impossible to overswing.

The main trouble in connection with golf writing is that nearly all the great professionals have thousands of books in circulation telling unfortunate golfers how to become great by a route that they themselves never traveled. Needless to say the handicap to the ordinary golfer is immense. If I merely sat down and wrote the truth I could excuse any one who used the weight of sixteen open championships and many others against me. It is quite another thing when I show how clearly the winners of these championships contradict each other, and even themselves, and I then put the simple obvious truth before the inquirer and say, "Now shed the light of your reason on it, my lad." It really is very simple when you have it explained

by some one who knows, who is not merely groping for words, more words, mere words. Verbiage, verbosity, verbigeration, truly your composite name in English is golf book!

I have received letters of thanks and acknowledgments of all kinds from all parts of the world from people whom I have released from the thraldom of the fetich of the left. Here is what an American professional at San Antonio, Texas, has to say: "It has taken me years of persistent effort to bury the many prejudices against the proper use of the right arm, but they must go, and I am glad to see you have voiced sentiments strong enough to make men stop and think over the situation. Let us hope they will act."

In which pious hope I naturally join; and with that I am content now to leave the final judgment —so far as it affects you—with you.

CHAPTER XVI

THE GOLF CLUB

GOLF is so well played nowadays that it is scarcely exaggeration to call it an exact science. Certainly those who excel at it require to play it with almost mathematical precision. For this reason, if for no other, it behooves the intelligent player to see to it that he is provided with the best possible implements wherewith to play the game.

Consideration of this question opens up at once a wide field of debate which goes to the very heart of the principle of the modern golf club. Originally every ball-striking implement was crooked, or curved. The cricket-bat was a kind of curved club. It has been straightened. The "crosse" used in la-crosse was originally so made that the blow fell off the line of the handle. That has now been altered. The tennis racket was in the old days lop-sided. Even the billiard cue was crooked, the original billiard cue being shaped like the ladies' bagatelle cue.

These, however, have all been straightened, and there is a general tendency on the part of all ball

striking implements to come into line with the principle of having the point of impact in line with the shaft or handle.

This is shown in a marked degree even in those clubs or bats which retain the curve or angle between the shaft or handle and the striking portion. For instance, the hockey-stick has had its head much curtailed in order to bring the striking point nearer to the handle, as it is recognized that this gives greater power and accuracy.

Those who are familiar with the construction of the old golf clubs will remember that the head was very long. In the modern golf club, especially in the driver, the tendency is to "ball" the head as close as possible to the shaft, and Harry Vardon in *The Complete Golfer* says that this tendency is justified by results.

There cannot be the least possible doubt of this. The tendency to put the point of impact in line with the shaft marks the irresistible march of progress in the evolution of ball striking implements and in due course the golf club must both metaphorically and actually "come into line."

In the "Schenectady" putter, a very well-known club, the principle was carried a step farther, inasmuch as the shaft was made to come out of the head very nearly at the center. This was a perfectly proper and legitimate development of the

golf club, but this club was barred by the Royal and Ancient Golf Club of St. Andrews on its links. The United States Golf Association very properly ignored the ruling and the "Schenectady" remains to this day one of the most popular putters in America.

In the "Vaile" putter I have carried the center shafted principle to the full length. The shaft runs in a straight line towards the center of the club's face, but at about two inches from the head the socket turns at an angle and runs into the heel of the club.

Neither of these clubs contains any principle which is not expressed and embodied in the time-honored St. Andrews putter with its curved shaft. Instead of allowing the curve to sprawl all over the shaft I have concentrated it at the socket. My putter is simply a modernized form of the revered St. Andrews putter. I put it up to the rules committee of The Royal and Ancient Club to say whether my club was a legal club or not on their links. I had an object in doing so.

They decided that it was not a legal club. Then I showed them what they had done by the famous —or infamous—"mallet" resolution. They had barred the old "St. Andrews" putter and almost every club in every bag on every links. Certainly every socketed driver is an illegal club; so also is

every iron club where the shaft runs into the head, for, according to their ruling, the head must be "all on one side of the shaft"!

It is of course sheer futility to speak of the "Schenectady" as a mallet-headed club. Any mallet I ever used or saw was longer *in* the driving line than *across* it. That is the essential principle of a mallet, it seems to me. How then can the "Schenectady" be called a club made on the *mallet* principle.

I am dealing at length with this matter, for I am sure that it is of fundamental importance to the game and that it will recur again and again and ultimately in such an acute form that probably The Royal and Ancient Club will have to reconsider its ill-advised attempt to define, or partially to define, a golf club.

More than seventy per cent. of the golf clubs now used are illegal according to the rules of St. Andrews. The position of this club in the world of golf is quite anomalous, is not for the best interest of the game, and should be altered. Nothing more ridiculous can very well be imagined than the simple fact that on St. Andrews your open champion is not allowed to use his favorite putter, an implement whose fame was made by another American golfer, who mainly by its assistance won the British amateur championship.

The march of progress is closer and ever closer towards the shaft, and its "logical conclusion," to use the well-worn phrase, will not have been reached until we are driving from a point in line with the shaft of the club. When this is done there will be increased accuracy in the game and increased enjoyment in it for many thousands of players who now suffer because of the unscientific construction of the golf club.

The American is a keen and analytical sportsman. He is already on the way to the truth; but in the Schenectady putter he is merely paltering with the principle. He is only half way to the actual thing. It will not be long before this is realized and then we shall see a revolution in the manufacture of golf clubs.

Vardon's actual words in speaking of the short head were: "The tendency of late years has been to make the heads of wooden clubs shorter and still shorter, and this tendency is well justified."

Perhaps the greatest structural defect in golf clubs outside of that already mentioned is the narrow face. Far too many golf clubs have narrow faces. Generally speaking the narrow faced club is a delusion and a snare. Rather should the faces be deeper. Especially is this so with many wooden clubs. I am convinced that without altering the balance or adjustment of weight materially

it would be an improvement to give many of the wooden clubs a little more depth in the face. As they are now they lack "room" for some of the finest shots in the game.

The American rule on the subject of the construction of golf clubs reads as follows:

Form and make of golf clubs.

The United States Golf Association will not sanction any substantial departure from the traditional and accepted form and make of golf clubs, which, in its opinion, consists of a plain head shaft and a head which does not contain any mechanical contrivance, such as springs; it also regards as illegal the use of such clubs as those of the mallet-headed type, or such clubs as have the neck so bent as to produce a similar effect.

The shaft of a putter may be fixed at the heel or at any other point in the head.

The term mallet-headed, as above used, when applied to putters, does not embrace putters of the so-called Schenectady type. U. S. G. A.

I think it was a great pity that the United States followed St. Andrews' questionable lead in any way. The good sense and sportsmanlike spirit of the golfer would at all times have been sufficient safeguard for the interests of the game. As the

rule at present stands it is bad. The full interpretation of the St. Andrews authorities about the head being all on one side of the shaft is not included in the copy of the rules that I have.

Under the American rules one might be excused for asking how can the neck of a club be so bent as to produce a mallet effect. What they really mean, but do not express, is a center shaft effect, and it would indeed be a great mistake if they were to try to introduce such legislation. A club with the center shafted effect is always a better driver than one with a straight handle, if the effect is properly obtained.

A friend one day handed me an old driver and said, "I cannot understand how it is, Vaile, I can always get thirty yards farther with this club than any other and I am always on the line with it. Can you explain it?"

I ran my eye along the shaft and saw that it had a most pronounced warp so that it was bowed quite a lot towards the line of flight, speaking now of the club as at the address. I told my friend that he had, in effect, a center shafted club for the warp in his shaft was the same thing as the curve in the old St. Andrews putter and as my angle at the neck of the Vaile clubs, that he had by accident got hold of a club that was scientifically constructed or had taken on a proper shape on ac-

count of climatic effect. There is a young professional in America who strips the shaft of every driver he gets until he produces this effect. He is one of the longest and straightest drivers in America. I sometimes wonder what would be the result if some cantankerous person seriously challenged the stupid "anti-mallet" rule. As a matter of fact there never was any necessity for it. It really started from the innocent question of a little club in New Zealand called the Nga Motu Golf Club. They made golf history by asking if it was legal for one to use a club fashioned like a small croquet mallet. St. Andrews seized on the opportunity to perform a work of supererogation and used its official position to oppose the scientific evolution of the golf club.

Can any one imagine a person, in an event of any importance, daring to appear on a green with "a small croquet mallet"? I think not, indeed. Nor would any one who knew anything about golf be so stupid as to try to do so, for, as I have shown, the deep (in this case it would be the long) sole is an added chance of error, without any adequate advantage that cannot be obtained better in another way; for instance, by shifting the shaft of the "Schenectady" into the center of the club, or, rather, so that the center line of its shaft cuts the point of impact, thus making it a true

center-shafted club and therefore a better golf implement than it now is. If this were done, nobody with any sense of the meaning of words could speak of its mallet principle, unless perchance the owner took to putting with the actual heel instead of the face!

CHAPTER XVII

THE GOLF BALL

I DO not intend to inflict on my readers a history of the evolution of the golf ball. There is really comparatively little to tell that is not generally known of the outstanding characteristics of the ball since the days of the old feather ball, down through the "guttie," which we then thought was the last word in golf balls, until the rubber-core passed it into the ranks of the "has-beens."

What the golfer of to-day is concerned with is the ball he now uses, and in that he has a very great, in fact a consuming, interest. I had this brought home to me in a most remarkable manner in London some years ago. I had written for various reviews, magazines and newspapers articles on almost everything connected with golf. I had had no cause to complain of any lack of interest in my articles. I generally approached my subject from an angle different from the ordinary view-point, and until one earns one's right to do this in London it comes nigh to sacrilege; indeed,

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CHARLES EVANS, JR.

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when golf is the subject, it is a question if it is not more than sacrilege to introduce new thought, even gently to agitate the cobwebs of tradition.

Well, as I have said, I had plenty of evidence of general interest in my work; but one day I took it into my head to attack the marking of the modern golf ball, as being unscientific in the extreme and prejudicial to the flight and accuracy of the ball. My objection rested mainly on two grounds, that it was by excrescence instead of by indentation, and that in any case the marking was excessive.

This controversy was easily the greatest in the history of golf. It ran for four months, and during that period many interesting and amusing things were said and done.

I shall never forget the look on the face of the editor of *The Evening Standard,* who published my first article on the subject, when I said to him simply—and modestly I hope—"I am going to knock the pimple off the golf ball."

"That certainly will take some doing," he said. "Yes, indeed," I replied, "but it will be some fun"—and it was. Well, the pimple, or bramble, has not yet become obsolete, but before many years have gone by we shall find it only in museums and collections.

The origin of the marking of the golf ball is

fairly well known. The old feather balls were smooth and they were erratic in their flight. After they had been played with a little and had been hacked about and marked it was found that they held to the line of flight better. After this they were marked by hammering and this was a great improvement.

When the gutta percha ball came in it also was marked. Probably the best and simplest marking ever used was the sunken line, if I may so describe it. This consisted of small grooved lines running in circles round the ball. There were two poles at right angles to each other, thus the lines of the circles, which of course varied in size as they were regulated from the pole to the equator, cut each other as they crossed. This divided the ball roughly speaking into small squares each of which was surrounded by grooves or sunken lines. This ball both carried and rolled perfectly. I never heard a complaint about it, and the marking held its own for a long time. Of course there were many variations but there was nothing that proved superior to this marking in any respect whatever.

Then came the rubber-core and with it a host of new markings, most of them grotesque and haphazard and introduced absolutely without thought, indeed, in the majority of cases, by people who

were incapable of the kind of thought necessary to deal with a subject such as this.

We had arrived at this condition of affairs when I published my first article on the subject. I told the editor of *The Evening Standard* that there would be an immense outcry from the trade. There was. He sent an assistant to interview them about my ideas. They were quite satisfied that I was a fit subject for "inquiry" as to my mental condition. The idea was preposterous. I was a mere theorist. In fact it was the usual thing. They were practically unanimous in their opinion that my opinion didn't amount to anything anyway.

This interview was duly published and my friends all sympathized with me until I got tired of telling them that I had caused it to be done, as I wanted to get the trade opinion *on record,* where they could not go back on it. Also I explained to them that the trade, from a trade point of view, was quite right to say that I was foolish. They had millions of foolish balls to sell and my ideas would not assist in selling them.

The controversy became furious. About this time Professor Sir J. J. Thomson delivered his famous lecture on *The Dynamics of the Golf Ball* before the Royal Institute of Great Britain. I thought that possibly he might be able to shed

some light on the disputed points so I asked him if he could explain why a smooth golf ball will not fly truly, while a properly marked, or indeed an over-marked, ball will respond to the influence of the driving force consistently until the marking gets knocked off it.

Professor Thomson was constrained to admit that he did not know the reason, and in his lecture he did not make any attempt whatever to explain this phenomenon. I have never seen it explained, and I am not positive that I can explain it, but I intend to try and to put it up to some one else to show that I am wrong and to produce the real explanation, or one that is better than mine. I need not be ashamed if I fail, for in my lack of knowledge—if so it be—I shall have much good company.

We all know that nothing flies well without a tail. Rob a bird of its tail and it is nearly as bad as a ship without its rudder. Try to shoot an arrow without a tail and certain it is that it will fall to earth you know not even whereabouts, until it has done it. Can you imagine a kite flying well without a tail? Where would an aeroplane be without a tail; and so I might go on for quite a while, but let me come to something more nearly resembling our golf ball.

The old round bullet was not remarkable for

the length of its carry nor for its direction until we gave it a tail, by providing it with extra length and putting a hole in one end wherein we inserted a conical wedge of wood that on the explosion pressed the butt end of the bullet open until it engaged the grooving of the rifle, thus giving the bullet a spin, and providing it with what in effect was a small flange at its tail, for the bullet did not then take the grooving on its solid part if I am correctly informed.

That, however, and its modern development do not concern us. We know that the modern bullet flies better than the round bullet did and we know that it is longer and that it carries spin. We know that it holds to its course better. It may be wrong to say that it has a tail. It would seem at first that it is, but in effect it is almost as much entitled to a "head" and a "tail" as an arrow.

Now, we must come back to the golf ball. It has always seemed to me that the main reason why the smooth golf ball will not fly straight is not because it has no tail, but because it cannot keep its tail on. That requires some explanation.

It will readily be admitted that the air in front of a swiftly driven golf ball must be somewhat compressed. It also seems reasonable to assume that there is, immediately behind the ball, some-

thing resembling a vacuum in that the air must be thinned to compensate for what is going on in front of the ball. We all know the old saying that "Nature abhors a vacuum." Probably this is correct. If so, we know that Nature is doing her best to fill up the space behind the ball, from the condensed air in front, until that which is behind the ball regains its normal density.

This operation means a continual flow around the ball of air that is denser than the ordinary atmosphere. I am speaking in this case of a ball without spin. In the ball that is marked by excrescences this condensed air is flowing in between them and perhaps over them, in the ball that is marked by dimples it is flowing in and out of them, in the ball that is marked by communicating indentations it is flowing through such indentations regularly and perhaps over-flowing.

In each of these cases there is a "stream" of condensed air flowing over the surface of the ball on its way back to regain normal density at, say an inch or maybe two, behind the ball. Some will say of course that the air is constant and that it is the ball that is moving. I think that my way of putting it makes my idea clearer and we may leave it to the scientists to improve on it.

It thus happens that our rough golf ball is provided with a tail of compressed air, or should I

say that it flies in a cylinder of compressed air which holds it to its flight?

Now supposing that this explanation is correct what explanation have we to offer of the remarkably erratic flight of the smooth golf ball. I have had them made to my order with varying degrees of fineness in the marking and the manner in which the smooth balls ducked and soared and swerved was most remarkable. They were as erratic in flight as a butterfly. How is this to be accounted for?

The only reason I can advance is that on account of the smooth ball having nothing to hold it into the condensed air cushion in front of it, as in the case of the marked ball, when the pressure in front becomes excessive the ball "slips it" and starts off on the line of least resistance to look for another chance to repeat its performance. Some people would argue that this is unlikely, that the pressure must be equal all round, in front at least, and so forth. That might be technically correct were we dealing with a perfect sphere of homogeneous quality but we all know, to our cost, the rubber-cored golf ball is frequently not a perfect sphere, and that its center of gravity is very often not in the place where we had hoped it was—especially when we are about two feet six inches from the hole!

That is the best explanation I can give of a matter that has proved a mystery to England's leading physicist. If it stimulates some one to produce something more illuminating I shall be pleased. In literary work, as in golf, I like generally to do those things I know how to do, but he is a poor sportsman who will not risk a shot when it seems to him to be the only one to play, because he does not know it perfectly.

Shortly after the beginning of the great controversy about the relative merits of marking by indentation and by excrescence I had a number of golf balls with varying degrees of indentation made for me. My readers must understand that this is an expensive amusement for those who have to pay the bills. Each pattern cost for the mold alone over fifty dollars, not to mention time and other incidentals.

I had asserted that the modern bramble or pimple marking was unscientific and excessive. I thought that it was "up to me" to prove it. I had a golf ball with an extremely fine marking made. I had decided that I should start at the other extreme and find the mean. When this ball was painted the paint filled up the interstices. I shall never forget the trial of that ball. The erratic nature of its flight was the most remarkable thing of its kind that I had ever seen. George Duncan

and I tried it out. It zigzagged and soared and ducked in a manner that was to me at that time truly incomprehensible. It set me seeking for the explanation which perhaps I have not got yet.

I knew of course that all I had to do was to increase the size of the indentations. I saved a lot of time by producing the "Vaile" ball. This was the first rubber-cored ball to be marked by indentations. It was the old two-pole cross-circle marking. The ball, as indeed I knew it must, both flew and ran perfectly. You will ask me of course why I am not running it commercially if it was a success. It is a perfectly fair question and the answer will amuse you, for it is not one that you, or I, would expect in England. Golfers said that the marking was too much like that of the old guttie!

It certainly was not too much *like* it. It was the same marking. There never was a better marking for a golf ball and I doubt if there ever will be. I was the first to put it on the rubber-cored ball, where it, and nothing else, should be to-day. Any slight deviation of flight can be immediately corrected by altering the depth and width of the lines by the minutest fraction of an inch.

I need not now emphasize the change in thought that has taken place with regard to the marking

of the golf ball. It is no longer King Pimple, and the good London tradesmen who said rude things about me are selling and praising millions of dimple balls which would be much better fliers, if they only knew it, if the dimples had communication trenches.

What would a champion billiard player think of one who suggested to him that it would improve the run of the balls if one were to put little lumps all over them. Well, be it remembered, that the effect is the same on a billiard table and a putting green. The degree is what varies.

Following this illustration it is easy to see that if one cuts grooves into a billiard ball it would affect the truth of its running much less than the same sized excrescences would, or to confine the example to pimples and dimples, a golf ball could rest on one dimple, but it requires three or four pimples to hold it steady. This is about the relative reliability or stability in the final test of rolling on a perfect plane.

It is in short puts on fiery greens that the vice of the bramble marking shows itself. If in addition to this, the golfer is ill-advised enough to use a shallow-faced putter, he will indeed require our sympathy.

This question of bramble marking is of more importance as one nears the hole. Very many

people cannot believe how little it takes to put a two foot put off the line. Suppose in such a put one hits a pimple fairly on the head and it happens to lie across the line to the hole and not in it. Will it affect the direction? Undoubtedly. It would not matter in an approach put. The strength would overcome the crudity of your implements and would hold the ball up against the irregularities of its surface, but it is less so as one gets nearer to the hole.

I must give here an instance from another game that seems to me quite apposite. A tennis racket was introduced some years ago for which the inventor claimed superior power to obtain cut because every intersection of the strings was knotted. One could indeed get a great degree of spin with this racket, but it was found that in the delicate volleys at the net the knots interfered badly with the accuracy of the stroke, so much indeed, as to render the racket quite useless for practical tennis. The same thing exists, near the hole particularly, with the ball that is marked by pimples, brambles or any other excrescences.

Any chapter on the golf ball would be incomplete without some account of the remarkable series of experiments conducted by Sir Ralph Payne-Gallwey, the famous wild-fowler and author

of *The Projectile Throwing Engines of the Ancients.*

During the early stages of the controversy Sir Ralph wrote to me and very kindly volunteered to conduct a series of tests I had suggested if I would send him the golf balls, which I very gladly did.

Sir Ralph has some wonderful catapults constructed on the same lines as the mischievous machines that formed the heavy artillery of the Romans. With one of these he could hurl a twelve pound stone a quarter of a mile. As a neighbor his good-will should, I think, be worth cultivating.

He used a smaller machine for the experiments he made for me. His results were extremely interesting and they were embodied in two articles which occupied three columns of *The Times.* I shall give as fully as I can those points of interest to the golfer and the golf ball manufacturer, in the hope that the latter may realize quickly the soundness of my contention and banish the pimple or bramble marking.

One important thing that Sir Ralph did was to show that the center of gravity is wrong in a great majority of balls. I suspect that it must be very hard to get a rubber-core with its "floating center" right in this particular.

Many golfers would think that this is a matter of practically no importance. Let them proceed

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to undeceive themselves by making a small hole in the case of a ball, inserting a buck shot, fixing it there with soap or wax, and trying to put with it. Then they will have a better understanding of what center of gravity means.

I may say that I am inclined to think that the peculiar double swerve that one so often sees at golf is the result of defective center of gravity. I have often seen well-hit drives by famous golfers swerve to the right, swing back again to the line and go on to the hole without deviation from the line.

I am familiar with the rare phenomenon of double swerve through an adventitious change of the axis of rotation during flight. This practically never occurs in golf and when one sees it in any other game there is always a considerable amount of irregularity about it, as, indeed one might expect from the nature of its production; but this sinuous double swerve of golf is so regular and so consistent in its manifestation, when it does occur, that I have been forced to the conclusion that it is a matter of defective center of gravity.

A manufacturer will not supply a customer with something he does not demand. The golfer is a good natured soul who takes what is given to him, for the most that can be got out of him, and asks no questions. When he cannot play he says

nasty things about himself, which generally is right and also a proper frame of mind; but, oh, happy thought, if he only knew it, the golf ball is not doing its fair share as often as it ought to. The shape, resiliency, and center of gravity of the golf ball are matters of the utmost importance to the golfer, yet he takes all these for granted with a confidence that is quite touching. One may take fifty golf balls and test them for shape, resiliency, center of gravity and weight, and the odds are even that twenty-five of them are different from the other twenty-five.

It is easy to test the rubber-cored balls as regards their center of gravity. Sir Ralph did this by placing the ball he desired to test in a basin of water until it came to rest, when he marked the center of the spot that was protruding with a pencil. He found that this spot always came back to the same place, no matter how the ball was dropped into the water or rolled about. This showed conclusively that the center of gravity was wrong.

Sir Ralph found that the guttie ball, as was to be expected, was much truer as regards center of gravity than the rubber-cored balls. He tried these and the miniature ball that would not float in water, in a solution of salt and water.

His experiments were really most exhaustive.

He found that there was a considerable variation in the degree of error. In some cases, especially with the smaller balls, the marked spot came up in two seconds, while some of the others took from four to six seconds. He estimated the comparative error in these balls by putting the marked spot downwards in the water and then taking the time it took the ball to return to its original position with the spot in the center of the exposed portion.

The catapult that Sir Ralph used for his experiment with regard to the flight of the ball was a small model of the formidable machine I have already referred to. It will pitch a golf ball from 180 to 200 yards away according to the amount of tension employed and the elevation given.

The power of the engine comes from twisted cord and the arm of the machine is two feet eight inches long. There is a cup at its upper end which holds the ball. Sir Ralph can throw the balls any intermediate distance up to 200 yards and at any elevation he wants. He conducted experiments with balls thrown by this catapult and also with balls hit away by it, as he says, in a manner similar to a golf club. He found that in each case he got unvarying accuracy. There was no slice, pull or cut, as indeed was natural.

Sir Ralph found that the accuracy of flight of

a good ball was very remarkable. He pitched one ball twenty times so that it landed each time within a few feet of a peg put in at 180 yards from the machine.

Sir Ralph found, as I had confidently asserted would be the case, that against the wind the balls with the roughest markings always carried the shortest distance and that they tended to soar a good deal in their flight. This generally came in after they had gone about two-thirds of the carry. It is apparent from this I think, that in all cases of drives with backspin the excessive markings would be detrimental so far as regards distance.

Sir Ralph found that in this matter of soaring there was a distinct difference between the very rough balls and those that were a little less so. He proved beyond the least shadow of doubt that on account of reduced friction the less roughly marked balls carried farther than those which were heavily marked. Naturally the flight of these balls being lower they had on this account also an advantage.

These remarkable experiments showed too that in a cross wind unless there is spin on a golf ball it is not affected nearly so much as most people think. It was found that in a fresh side wind from the left all the balls except the guttie, at a range of 130 yards, landed 8 to 12 yards to the

right of the mark, and that the more roughly marked balls consistently showed the greatest deviation from the line.

In this experiment Sir Ralph discovered a very remarkable fact. It was always the ball with the most defective center of gravity that made the worst deviation and it always ran at a more acute angle off the line of flight after it struck the ground.

We thus see that it was always the most roughly marked balls that suffered most from the action of the wind. We see that it was one of them, which also suffered from a defective center, that was carried the extreme of twelve yards off the line. We may thus assume that in this distance this would probably be the maximum deviation in a wind of the nature described by Sir Ralph Payne-Gallwey.

When we consider this result we can see the golfer is frequently suffering from a very severe handicap that he does not even suspect, when he uses a ball that allows the wind to get such a grip of it as the bramble marked ball does, and which moreover has superimposed upon this handicap a defective center, which carries it further off the line, and the added vice, after landing, of running away at a sharp angle to the line of its drift. What a virgin field is here for him who would

clearly explain in a scientific and convincing manner that it was not he that sliced the ball, but—and this is where it comes in.

I sent Sir Ralph Payne-Gallwey some samples of the almost smooth ball that I have referred to on account of its extraordinary flight. I called this ball "The Ruff" to distinguish it from others.

Sir Ralph says of it: "This ball was quite smooth, as smooth indeed as a billiard ball. I tried this smooth ball from the engine and it 'ducked' every time in an extraordinary manner, its length of carry being seldom more than eighty yards."

This is the ball the interstices of which had been nearly filled up with paint. It was nearly as smooth as a billiard ball, much more nearly indeed than had been intended.

Sir Ralph thought that for some unexplained reason the form of this ball might not be suitable for discharge by a projectile engine, so he carried his experiments further still. Let me quote him.

He says: ". . . and as I could not drive it further than about eighty yards with a golf club, I engaged the well-known professional Edward Ray, to play a round of the green with this ball at Ganton. As Ray is an exceptionally long and accurate player with driver and cleek I felt the ball would have a fair chance of going, if it

could go. From the first tee the ball did not carry a hundred yards, though, to all appearances, struck clean and hard. I thought that for once in a while Ray had missed his drive, but as the same thing occurred from every tee and through the green for the next six holes, there was no disputing that a smooth ball was quite useless for golf. I then proceeded to nick the ball slightly with the point of a knife, spacing the small raised nicks about one third of an inch apart, the ball being still a very smooth one in comparison to any of the usual kinds. After this slight alteration the ball flew splendidly, whether off wood or iron clubs, neither too high nor too low, but quite straight, and with the very slight rise towards the end of its carry that is the essence of perfect flight in a golf ball, some of the carries when measured from the tee being well over two hundred yards."

This surely is a sufficient vindication of the soundness of my claim for less marking.

Sir Ralph, moreover, says that on his return home he shot this ball from his small catapult and that it then several times out-distanced the best record made by any of the other balls he had tested.

He was not, however, satisfied to leave it at that, but proceeded to chip up many more nicks on the

same ball. He found that this reduced the flight of the ball by several yards and also caused it to soar too much against a head-wind as is the case with the ordinary rough-marked golf ball.

It will thus be seen that Sir Ralph was very thorough in his tests. In summing up his conclusions he says: "From such practical tests it is evident that the surface of the golf ball is far too rough, and that it would fly with more accuracy and farther, especially with a head or a side wind, had it much less numerous and prominent markings on its cover."

This is exactly what I contended in my original article. It is what I still say. It is what the makers of golf balls must realize if they want to improve the flight and run of the ball. Their work is too coarse. They will not see that. Golf is a game of infinite delicacy. It cannot be played coarsely. I do not believe that a really coarse man could play it very well. Near the hole it is a particularly delicate matter. We all know that except the ball makers.

Sir Ralph has some most interesting things to tell us about the experiments he made in driving with his machine.

He says: "This striking arm hit the ball away just as it is hit by a golf club. The ball I suspended by gossamer silk from the projecting

beam of a little gallows fixed over the engine, and so positioned that the enlarged upper end of the arm struck the ball fair and true and with its full force and at the same angle every time."

I was not present at these experiments. Sir Ralph was, however, good enough to send me a copy of his book *The Projectile Throwing Engines of the Ancients.* I find it hard to follow him when he says, "This striking arm hit the ball away just as it is hit by a golf club," for the catapult was hitting the ball from below it while the golf club hits it from above. The arcs are entirely dissimilar. We know, however, that the balls were all struck in a similar manner and, where comparisons as to carry were to be made, with similar force.

Continuing his remarks about driving, he says: "Another curious thing; the ball with the most untrue center of gravity usually made one, and occasionally even two, swerves in the air when hit against the wind, though this eccentricity in its line of flight was less noticeable when it was thrown from the engine."

I had forgotten that Sir Ralph's experiments had in some degree confirmed my idea about the double swerve of the golf ball being due to defective center of gravity. Here, however, he sets us a new puzzle. It may be that the center being

off the line and the main spring of the ball being around the center that the coefficient of restitution, as I think it is called, is strongest off the center and thus gives that side of the ball on which the core is situated a tendency to get away from the club first, soon to be corrected as the weightier side lagged, swung back and round to the other side and then repeated the performance for the return swerve. That is the only idea I can advance for this double swerve. I dealt with the subject of double swerve generally many years ago in *The Field,* London.

Sir Ralph Payne Gallwey was occupied for several days in these experiments. He fired fully five hundred shots and then he went inside and continued his experiments in order to arrive at a just comparison between the merits of these balls on the putting green.

It is not necessary just because this is a table d'hôte dinner to take every course. Those who are not interested in this matter need not follow me here, but Sir Ralph's experiments as regards the run of the ball are so remarkable and so important that I have decided to put them on record in America so that they may do their share in affecting the new thought in golf and things appertaining to golf.

He says: "I obtained a piece of lead three-

quarters of an inch thick, two inches wide, and three feet long, in which I cut a straight and smooth groove one inch wide. One end of this piece of lead I rested on the cushion at the baulk end of a billiard table, and directed its other end towards the spot on which the red ball is placed in the game of billiards." Sir Ralph speaks here, of course, of English billiards. This spot is in the middle of the table about nine inches from the top cushion. The length of the table is twelve feet and its breadth six feet. "The forward end of the grooved lead I tapered off so that a ball ran evenly and smoothly from the groove onto the table without any drop or deviation as it left the piece of lead, which, from its weight, when once set, could not change its position. I now placed a thimble on the spot at the far end of the table and rolled an accurately turned wooden ball the same size as a golf ball down the sloping groove. After a little adjustment of the lead piece its line of fire was correct, and I was able to knock the thimble off the spot fifty times in succession. The ball traveled with sufficient speed just to reach the cushion beyond the thimble when the latter was moved aside, and the shot at the thimble nicely represented a slow put of eight feet in length."

Sir Ralph found on testing the different golf balls that he got widely different results. He took

each ball and tried it twenty times at the thimble with the result that they seldom hit it more than three or four times in a series. Some of them rolled off as much as two feet to the right or left while those which had been proved guilty of a defective center of gravity occasionally rolled away into the corner pocket, a little matter of three feet off the line in eight feet. It sounds almost incredible but it is perfectly true. I had tried the same thing in a slightly different way myself. This is what the unfortunate golfer often has "going against him" on the green.

Sir Ralph emphasizes a point that I often make namely, that the inaccuracy of the bramble ball is overlooked because in approach puts the force of the blow holds it up against its own tendency to wabble. He says: "Any of the balls if played fairly hard from a cue could be made to strike the thimble every time, but then such a hard-hit ball would go far beyond the hole in golf, and probably overrun the putting green. The smooth billiard tablecloth may be taken to represent the hard, bare and fast putting green of a dry summer."

Sir Ralph was most thorough in his experiments. He covered the table with a strip of rough green baize and tried the balls again. He then found that the balls ran with much greater accuracy, except those that were defective as to center

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FRANCIS OUIMET

Finish of Drive

of gravity, and that they now hit the thimble eight or ten times in a series of twenty tries.

I think we may take it for granted that this series of experiments proved, that especially on a hard fast green, and particularly for puts that have not much force behind them the bramble or pimple marking, or indeed any marking by excrescence is most treacherous.

Sir Ralph's advice to the golfer about a golf ball is: "Select a ball with as smooth a cover as you can find, for though all golf balls require to be roughened in order to steady their flight, those most deeply scored travel the shortest distance, and are most affected by a head or side wind."

If the great controversy about the marking of the golf ball had had no other effect than this truly remarkable series of experiments by a man who is famous as a shot and an author, and who is moreover a practical golfer, it would still have served golf.

CHAPTER XVIII

THE FLIGHT OF THE GOLF BALL

THE flight of the golf ball has occupied the attention of some very eminent men. Golf was not so popular in Newton's time as it is now. If it had been we should no doubt have had the benefit of his knowledge in connection with various matters appertaining thereto.

Newton is more celebrated for what he is supposed to have discovered through the flight of the apple. He was not, however, above turning his mind to matters of less moment than the law of gravitation; and over two hundred years ago, in most learned and weighty language, he laid down the principles governing the swerve of a tennis ball.

Incidentally I may remark that when I applied the same principles to cricket and explained the swerve of the ball in England to English cricketers in my book *Swerve, or the Flight of the Ball,* a famous English cricketer, famous, I may say, more for his physical than his intellectual "wallop," declared that what I said was not to be taken

seriously. Poor Newton! I did not give him away, and now in The Times Library, London, that book of mine may be found catalogued as a work on applied mathematics, and I do not believe that I could do a simple equation without assistance.

I forget how I got my "greatness." I wasn't born with it, and it certainly was not thrust upon me. I am certain Newton helped me; but I have never confessed it until this time, and I wouldn't do it now in England. If this book gets into the hands of the English press I am undone, and Newton will come into his own!

We have, however, in the records of golf writing some remarkable contributions by learned men.

One of the first was by Professor Tait, father of the famous Freddie Tait, who was afterwards killed in the Boer War, a fine golfer, and by all accounts a fine fellow, as are so many, who belong to the grand guild of the club that it makes the writing of golf books more a matter of pleasant club conversation than severe literary parturition.

Professor Tait published an article in *The Badminton Magazine* of March, 1896, entitled "Long Driving." Professor Tait really was a very learned man and he became most interested in golf, and indeed was himself by no means a poor player.

He worked it out by mathematics that it was beyond human capacity to drive a golf ball more than a certain number of feet and inches, which he duly set down, and next day his famous son, somewhat undutifully, so the story runs, knocked his father's calculations sky high by driving a golf ball much farther than the mathematical limit.

Here was a pretty to do. The situation had to be faced somehow. Professor Tait again bent his mind to the question and came to the conclusion that there must be some force in the golf drive which he had overlooked. It did not take him long to decide that it was backspin.

He went into the matter fully and wrote his article for *The Badminton Magazine* and it has been quoted reverently ever since by any one who ever wrote anything about golf except me, and the only thing they didn't say to me because I did not reverence it was *De mortuis nisi nil bonum;* and I fully expected that.

As a matter of fact Professor Tait's article is founded on a fundamental error to which I have before referred, namely that the beneficial backspin of golf is obtained from the loft of the club. It is an error that is by no means uncommon and he has been followed in it of recent years by a physicist of even greater renown, Professor Sir J. J. Thomson, M.A., L.L.D., D.S.C., F.R.S.,

M.R.I., O.M.; Cavendish Professor of Experimental Physics, Cambridge; Professor of Physics, Royal Institution, London; Professor of Natural Philosophy, Royal Institution, and winner of the Nobel Prize for physics, 1906.

The title of his paper was *The Dynamics of a Golf Ball,* and it was read before The Royal Institution of Great Britain. We may see that neither the institution under whose auspices the lecture was delivered nor the lecturer was inconsiderable. In fact so much importance was attached to it that I am wondering if by any chance I can get recommended for the next Nobel Prize for physics for showing clearly, as indeed I have already done, that Professor Tait and more recently Professor Thomson, who indeed followed Professor Tait's lead very closely, were quite wrong in their deductions.

Professor Tait said: "The most cursory observation shows that a ball is hardly ever sent on its course without some spin, so that we may take the fact for granted, even if we cannot fully explain the mode of its production. And the main object of this article is to show that long carry essentially involves underspin."

There are two important mistakes here. It wants much more than "The most cursory observation" to show that "a ball is hardly ever sent

on its course without some spin." Nobody has ever yet established that fact, and it is undoubted that the vast majority of golf balls that are driven by good players have no spin—particularly backspin—that appreciably affects their flight, that they are to all intents and purposes cleanly hit balls, with generally an uppish tendency in the stroke which kills all backspin.

Professor Tait continues: "To find that his magnificent carry was due to what is virtually a toeing operation—performed no doubt in a vertical and not in a horizontal plane, is too much for the self-exalting golfer!"

And so indeed it should be, for nothing is further from the truth.

Professor Tait, however, continues: "The fact however, is indisputable. When we fasten one end of a long untwisted tape to the ball and the other to the ground and induce a good player to drive the ball (perpendicularly to the tape) into a stiff clay face a yard or two off, we find that the tape is always twisted in such a way as to show underspin; no doubt to different amounts by different players, but proving that the ball makes usually from about one to three turns in six feet, say from forty to a hundred and twenty turns per second, this is clearly a circumstance not to be overlooked."

This is one of the most remarkable instances in the history of science of the investigator finding the thing he was looking for instead of starting out to ascertain the truth. In fact, he went so far as to make his friends produce the results he wanted, but of course innocently, and equally innocently Professor Sir J. J. Thomson followed him and fell into the trap.

It is in a footnote to his lecture that Professor Tait gives the whole thing away. He says calmly and unsuspectingly: "In my laboratory experiments, players could not be expected to do *full* justice to their powers. They had to strike as nearly as possible in the center, a ten inch disc of clay, the ball being teed about six feet in front of it. Besides this preoccupation, there was always more or less concern about the possible consequence of rebound, should the small target be altogether missed."

Aiming for the center of a ten inch disc of clay six feet away from the tee would give us a ball five inches from the earth six feet from the tee!

What kind of a stroke would produce such a shot? Obviously only the downward blow and the low follow-through that produce backspin. We can see clearly that Professor Tait arbitrarily settled the trajectory of the ball. He made the golfer play the ball he was looking for.

Instead of a ten inch disc of clay he should have had a clay bank or have had half the side of his wall covered with clay and have allowed the golfers to play their own natural strokes. Then he would have found something entirely different. Where he made his error was in compelling his assistants to aim at a target so low as five inches at six feet from the tee. He left them no chance to do anything but play the low drive.

Assuming that the tee was half an inch high and allowing that the ball hit the very center of the target it would not have risen more than four inches in six feet. I think that we should expect to find some backspin in such a drive!

Professor Thomson started his lecture by saying: "This problem is in any case a very interesting one, which would be even more interesting if we could accept the explanations of the behavior of the ball given by some contributors to the very voluminous literature which has collected around the game. If this were correct, I should have to bring before you this evening a new dynamics and announce that matter when made up into golf balls obeys laws of an entirely different character from those governing its action when in any other condition."

Notwithstanding this somewhat pompous start Professor Thomson proceeded to explain most of

the "problem" on exactly the lines that Newton and I—or should I say I and Newton—had done some few years ago—to be more precise, Newton about 250 years and I, on the result of his knowledge, about seven years ago.

Whenever Professor Thomson was correct he explained everything exactly as I have laid it down in that work on "applied mathematics," *Swerve, or the Flight of the Ball;* and when he was not in accord with that he was wrong, and hopelessly wrong, too, both theoretically and practically.

If this were a matter of splitting atoms, subdividing elektrons, or discovering new gases I should not dare to raise my voice against Professor Thomson; but I happen to know something about this subject. I believe the Arab proverb says, "He is a wise man who knows that he knows. Follow him." The proverb does not give any short method of finding out whether or not "he" knows, so in this case if my readers want to be "in at the death," they must follow me and chance it.

Professor Thomson says: ". . . a golf ball, when it leaves the club, is only in rare cases devoid of spin, and it is spin which gives the interest, variety, and vivacity to the flight of the ball; it is spin which accounts for the behavior of

a sliced or pulled ball; it is spin which makes the ball soar or 'douk,' or execute those wild flourishes which give the impression that the ball is endowed with an artistic temperament and performs these eccentricities, as an acrobat might throw in an extra somersault or two for the fun of the thing. This view, however, gives an entirely wrong impression of the temperament of a golf ball, which is, in reality, the most prosaic of things, knowing while in the air only one rule of conduct which it obeys with an intelligent conscientiousness, that of always following its nose. This rule is the only key to the behavior of all balls when in the air; whether they are golf balls, baseballs, cricket balls or tennis balls."

Any ordinary unscientific person may well be pardoned for asking what is a ball's nose. If it were a bramble marked ball one might pick out an extra large excrescence and so name it but Professor Thomson does not mean anything so scientific as this. His idea of what constitutes the ball's "nose" is shown by the following quotation: "Let us, before entering into the reasons for this rule, trace out some of its consequences. By the nose of the ball we mean the point on the ball furthest in front."

Professor Thomson does not even state here whether he means farthest in front in the line of

flight or in the line to the hole. It is obvious that in the cases of a straight hit to the hole and a pulled drive the spot on each ball representing the nose would be in a different place.

As a matter of fact, however, Professor Thomson means, although he does not say so, "the point on the ball furthest in front" in the line of its flight.

This puts his explanation of swerve out of court at once. I know an English amateur who can pull a ball so that it will sail away out over the rough for thirty or forty yards and then swing in again to the middle of the course. Let us apply Professor Thomson's rule to this ball. If it always "followed its nose" it would never come back on to the fairway. It comes back because its nose is *pushed* round.

The trouble is that Professor Thomson wants to have the "nose" of the ball both a fixed and a moving point; but he cannot have it both ways. If the "nose" is a fixed point in front of the ball without spin the ball will always, with but slight variation, go straight after that "nose" without any swerve whatever. If the nose is meant to exist in a spinning ball it is obvious that there is not one but millions of noses. It is a new nose every time the revolving ball makes a movement of the decillionth of an inch—more or less.

The truth is that Professor Thomson's explanation tends at the outset to confuse. The swerve of the ball has nothing whatever to do with the turning of the "nose," or the millions of noses in any particular direction apart from the extra local friction set up, as already explained, on one part of the ball.

Professor Thomson makes it very clear that he is not well acquainted with the various methods of applying spin to balls in sport. He says: "A lawn tennis player avails himself of the effect of spin when he puts 'top-spin' on his drives, i.e. hits the ball on the top, so as to make it spin about a horizontal axis, the nose of the ball traveling downwards . . . ; this makes the ball fall more quickly than it otherwise would, and thus tends to prevent it going out of court."

I have played tennis—we do not now call it lawn tennis—for more than twenty years. I am the author of four books on the game, one of which is translated into French and German, published also in America, and is recognized both in England and America as the standard work on the game, and I can assure Professor Thomson that no tennis player ever dreams of trying to get top-spin on his ball by hitting it on top. The only result would be to "founder" the ball, to drive it onto the

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ground before it could even touch the net, let alone get over it and into the opposite court.

Sometimes when the bound is very high and very near the net one may hit the ball a little above the middle of its height; to use Professor Thomson's term, a little above its "nose" as seen from the opposing player's court, but even in such rare cases as these there is no attempt to hit the ball on "top." This is theory of the most unsound nature. Top-spin in tennis is obtained by hitting the ball generally speaking with a racket whose face is practically vertical and ascending in an oblique line across the intended line of flight of the ball, to put it very simply one "brushes" the racket up behind and against the ball thus gripping it and making it spring away with a lot of forward roll that is commonly called top or top-spin.

Professor Thomson indeed shows by diagram how this top-spin affects the ball, but even here he is in error. He shows the ball beginning to dip directly it is hit. It really goes quite a long way in nearly every case before the spin gets to work. Probably, almost certainly, on account of the great adhesion between the ball and the tennis racket, the ball rises after impact. It is in fact a certainty that most balls hit with top-spin do so rise

for a majority of them are hit below the height of the net.

Professor Tait makes this error in his article *Long Driving,* and it is quite clear to me that Professor Thomson is following him very closely in his statements.

Here is a statement by Professor Thomson about the soundness of which many of my readers will be better able to judge than I am: "Excellent examples of the effect of spin on the flight of a ball in the air are afforded in the game of base-ball. An expert pitcher, by putting on the proper spin, can make the ball curve either to the right or the left, upwards or downwards; for the sideway curves the spin must be about a vertical axis; for the upward or downward ones, about a horizontal axis."

I speak here, subject to correction, but I should imagine that all good pitchers tilt the axis of spin out of the vertical and so get gravitation in as an ally instead of fighting it by keeping the plane of spin horizontal. We get much greater swerve in the American service at tennis, where the axis of spin is tilted over, than we do in services where we keep the axis of spin nearly vertical.

Professor Thomson says: "If a ball were spinning about an axis along the line of flight, the axis of spin would pass through the nose of the ball,

and the spin would not affect the motion of the nose; the ball, following its nose, would thus move on without deviation."

The spin which Professor Thomson is here describing is that which a rifle bullet has during its flight for it is obvious that a rifle bullet is spinning "about an axis along the line of flight" and that the axis of spin does pass through the nose of the bullet. We know, however, that in the case of the rifle bullet there is a considerable amount of deviation, which is called "drift," and not swerve. This has never been very clearly explained although some most learned treatises have been written about it.

It is, of course, an impossibility to communicate this spin to a golf ball by means of a golf club, but reasoning from the analogy of the rifle bullet I cannot see that Professor Thomson is safe in so dogmatically asserting that there would be no deviation. In fact, I am inclined to think that if tempted I might show that a golf ball with a similar spin to the rifle bullet would deviate from its course.

I have just said that it is impossible to produce this spin with a golf club. The question naturally arises how could one make the test. I believe it could be done with a straight hit ball provided the ball was grooved in curves of such a nature that

the wind would be almost sure to engage them and so turn the ball until it acquired a certain amount of spin.

I saw a sample of such a ball some time ago. It had four to six poles and the lines were all in curves flowing one way. The idea was ingenious but the resulting patterns would not be popular with golfers; and while the ball might hold its flight well, in plain hit balls it would not, I think, have any advantage in the important class of balls hit with backspin, for it would naturally have a constant tendency to fight across the plane of spin of the backspin.

Professor Thomson performed some most elaborate experiments to prove the truth of those things which Newton explained about two hundred and fifty years ago and which were recognized as fundamental truths until I was rash enough to use them in London, when they were called my "theories." They never really understood how complimentary they were.

It is strange that although Newton thoroughly understood the theory of swerve he was in the same error as that of Professors Tait and Thomson, namely that it was the "oblique racket," in other words the "loft" that was producing the spin. He said, writing to Oldenburg in 1671, about the Dispersion of Light, "I remembered

that I had often seen a tennis ball struck with an oblique racket describe such a curved line."

It is not so much striking anything with an "oblique" instrument that produces spin, although in certain cases that will, of course, assist, as it is the striking of the oblique blow. Even with such a heavily lofted club as the niblick one will never get much backspin unless one plays the stroke designed to produce it.

It is when we get to slicing and pulling, however, that Professor Thomson gets quite out of his depth. At page 12 of his remarkable paper he says: "So far I have been considering underspin. Let us now illustrate slicing and pulling; in these cases the ball is spinning about a vertical axis."

This statement is very definite and quite wrong. I have already dealt very fully with the flight and run of the slice and the pull in the chapters devoted to those strokes. I have practically nothing to add to these except to say that any one who has had even a very brief experience of golf will know the different characteristics of the flight and run of the pull as set out by me. They will not require any argument to convince them that these entirely dissimilar effects are not produced by the same axis of rotation.

Professor Thomson performed some most in-

genious experiments to demonstrate the correctness of his theories about the slice and the pull. He had an electro-magnet and a red hot piece of platinum with a spot of barium oxide on it. "The platinum is connected with an electric battery which causes negatively electrified particles to fly off the barium and travel down the glass tube in which the platinum strip is contained; nearly all the air has been exhausted from this tube. These particles are luminous, so that the path they take is very easily observed."

These particles, I may say, take in Professor Thomson's mind the place of golf balls, and, by means of his electro-magnet he proceeds to show us exactly what golf balls when pulled or sliced do, but unfortunately for him Professor Thomson is wrong in his theory and he is starting out to make his "particles" do what he wants them to do, which in this case, is something that neither a pulled nor a sliced ball ever does.

At the beginning of Professor Thomson's paper he says: "I shall not attempt to deal with the many important questions which arise when we consider the impact of the club, but confine myself to the consideration of the flight of the ball after it has left the club."

If Professor Thomson had kept to this line of action it would have prevented him from making

a very amusing error. He says: "I have not time for more than a few words, as to how the ball acquires the spin from the club, but if you grasp the principle that the action between the club and the ball depends only on their relative motion, and that it is the same whether we have the ball fixed and move the club against it, or have the club fixed and project the ball against it, the main features are very easily understood."

I am afraid that not many of my readers will be able to "grasp the principle" here set out. There is herein no reflection on their mental capacity, but it seems to me that there is a very striking difference in the two propositions so hurriedly set forth by Professor Thomson. If we have the club fixed and project the ball against it we know that the ball will rebound from the club, but if we have the ball fixed and move the club against it, nothing that bears any colorable imitation of golf takes place, unless we move the club fast enough when we should simply smash it—and at least set up some similarity to the real game.

This really is extreme looseness of expression for so weighty a matter! I know quite well what Professor Thomson means to say, but I have not to deal with that, and even what *he means to say* is wrong. In the meantime I have only to con-

sider "a new dynamics" of how to drive the fixed ball!

I must pass over a good deal that Professor Thomson has to say and come to the rock on which Professor Tait and, following him, Professor Thomson have split. Professor Thomson says: "Suppose Fig. 27 represents the section of the head of a lofted club moving horizontally forward from right to left, the effect of the impact will be the same as if the club were at rest and the ball were shot against it horizontally from left to right. Evidently, however, in this case the ball would tend to roll up the face, and would thus get spin about a horizontal axis in the direction shown in the figure; this is under-spin and produces the upward force which tends to increase the carry of the ball."

This really is an amazing error for a famous physicist to make nowadays. Let us consider that the club he is speaking of is a driver. I have no hesitation in saying that the loft of a driver is practically innocent of having anything to do with producing backspin. The function of that loft is to lift the ball. The beneficial backspin of golf is always obtained by a downward glancing blow, and moreover by a blow that is moving in an arc and not in a straight line, although, of course,

when the blow is delivered the force is applied in one direction.

Professor Thomson errs grievously in showing the stroke proceeding in a straight line. This rarely if ever happens in golf. The stroke is upward or downward, far more often upward than downward; for scarcely any one properly trusts the loft of the club to do its part, a want of confidence in the club, I may repeat, that is wholly undeserved. This upward hit kills on the instant any approach to backspin the club might otherwise communicate to the ball for it tends to put the loft of the face at a right angle to the initial line of flight of the ball, thus destroying any obliquity in the impact. Even Professor Tait recognized this important point although he did not see the application of it as against his arguments.

Loft is not necessary for backspin. One could drive a ball with a club having a vertical face and obtain much backspin and a good carry, provided the tee were high enough to allow the cut down across the ball, and it would have to be a really high tee.

Although the blow that produces backspin is a descending blow there is of course much more forward motion than downward at and about the moment of impact so that all the ordinary principles

of the golf stroke are in the blow. The loft must get its chance to act as in any other stroke, but there must be no notion of leaving the loft to play the stroke for one unless one wants to be grievously disappointed.

I must return for a moment to one of Professor Thomson's statements that seems to me to be very interesting and to require some analysis: ". . . but if you grasp the principle that the action between the club and the ball depends only on their relative motion, and that it is the same whether we have the ball fixed and move the club or have the club fixed and project the ball against it, the main features are very easily understood."

I am now going to deal with what Professor Thomson meant to say. For this purpose let us take the case of an ordinary slice. We all know that a slice is produced by a glancing blow coming inwardly across the intended line of flight and Professor Thomson tells us that it is exactly the same whether we hit the ball with the club or fire the ball against the club. We must analyze this a little and see what results we get on paper before worrying about it any further.

Let us consider that we have played a perfectly good slice and that we did it by coming across the line at an angle of 35 degrees. Let us bolt our club down on the line quite rigidly at a right

angle to it, as it was when we got our slice. Let us now fire our ball at the club down a line at an angle of 35 degrees to the face of the club.

Now most of us know enough elementary mechanics to know that in hitting a still object such as the face of a club, the ball will come off it at the same angle at which it hit it, that is to say that the angle of reflection will be the same as the angle of incidence, making a trifling allowance for the loft of the club. Here we have one object that is held absolutely still and all the motion is confined to the ball.

Now we must consider the other proposition, the case in which the club strikes the ball. The ball flattens onto the face of the club to a considerable extent and while it is thus in adhesion the two travel together for a short distance. This slice is being played, remember, in the same manner as the first stroke. While the ball and the club are adhering they travel together across the line from where the ball lay to the hole. In effect the club picks the ball up and carries it a little way inwards towards the player's side of the line of flight before the ball leaves the club. At the moment of impact there is no angular spread of the ball in any way. The same argument applies with possibly less force in the case of the ordinary drive where the point at issue is the "spread," or angle,

of the ball after impact in a vertical plane instead of, as in the case we are considering, one that is almost horizontal.

The analysis that I have given of Professor Sir J. J. Thomson's famous lecture will show that this subject of the dynamics of the golf ball is not so simple that it may be dealt with successfully unless one, in addition to some knowledge of physics, also understands thoroughly the production of the various golf strokes.

In connection with the flight of the golf ball I am often asked to explain why the modern rubber-cored ball swerves so much more than the old gutta percha ball. This is supposed to be something in the nature of a puzzle but I believe the answer is simple. The modern ball on account of its greater resilience stays longer on the face of the club, although Mr. W. J. Travis, in *Practical Golf* says otherwise. It therefore has more time to be affected by the oblique nature of the stroke, and thus almost certainly has more spin than the old guttie had at the moment of leaving the ball. Every one knows that the swerve comes in mainly at the end of the flight of the ball. As the spin gets to work at approximately the same distance as it did with the guttie and the ball, from that point to the end of its carry, has a longer distance to travel the spin has a greater time within which

to work its will on the ball. If we add to this Sir Ralph Payne-Gallwey's discovery about the defective center of gravity so prevalent in the modern ball and his experiments proving how it assists drift it is easy to see that there is quite enough to account for the apparently greater amount of swerve. In the main however it is a question of the longer carry giving the greater spin more time to act.

Before closing this chapter I should like to suggest an experiment to any one who thinks that the beneficial backspin of golf is obtained by the loft of the driver as stated by Professor Thomson.

Prepare a block of wood or get a wall or other place fixed up so that it has the same angle as the loft. Against this fire a ball with a catapult or other instrument until you have ascertained the angle of rebound caused by the loft. Then at a yard or so, according to the force of rebound fix another piece of wood. Draw a mark round a golf ball so that it is a circle cutting both poles of the ball. Place the ball in the machine so that the circle is in the plane of its flight. Mark the top pole with a blue dot. Color the wall you are firing against red, or some color that will mark the ball. Deal similarly, but in a different color with the board that is to catch the rebound of the ball. Fire many balls at the first board and compare

the distance on them between the mark left by the first board and that of the second. It seems to me that if this experiment were properly carried out one could accurately measure the amount of backspin produced by the loft alone in driving. It would be found to be very small. An arrow should be put on the circle round the ball showing the direction of the backspin, and care would have to be taken to fire the ball in such a manner that the arrow was correctly pointed. It seems to me that an absolutely correct measurement could be taken in this manner.

AFTERWORD

And now, those who have followed me so far, will see that "The New Golf" is not so much "new golf" as it is old golf newly interpreted. It is in effect, golf as it has been played since golf was golf, but shorn of the cobwebs of tradition with which the game has been festooned by writers, even as though they were linked in a gigantic conspiracy to put mystery and confusion where simplicity and clarity should be.

Something more there is, it is true, in "The New Golf" than this. There are some modern developments of the game, there is one new stroke, there is the trend of the modern game clearly to be seen, there is, mayhap, some fresh thought, but in the main, "The New Golf" is just the grand, simple old game, taught in a sane and lucid manner, so that any one who turns to it for assistance may get it, and not be bewildered, as so often happens when one turns for help to a book on golf.

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